CIO

BUSINESS TECHNOLOGY LEADERSHIP

CIO HALL OF FAME
How this year's inductees reached the top of their game
Page 51

IS YOUR DATA SECURE?
Software and strategies to safeguard information
Page 23

BUILDING FOR THE FUTURE

How and why Bechtel dismantled its IT infrastructure and started over in the cloud

BY STEPHANIE OVERBY Page 32

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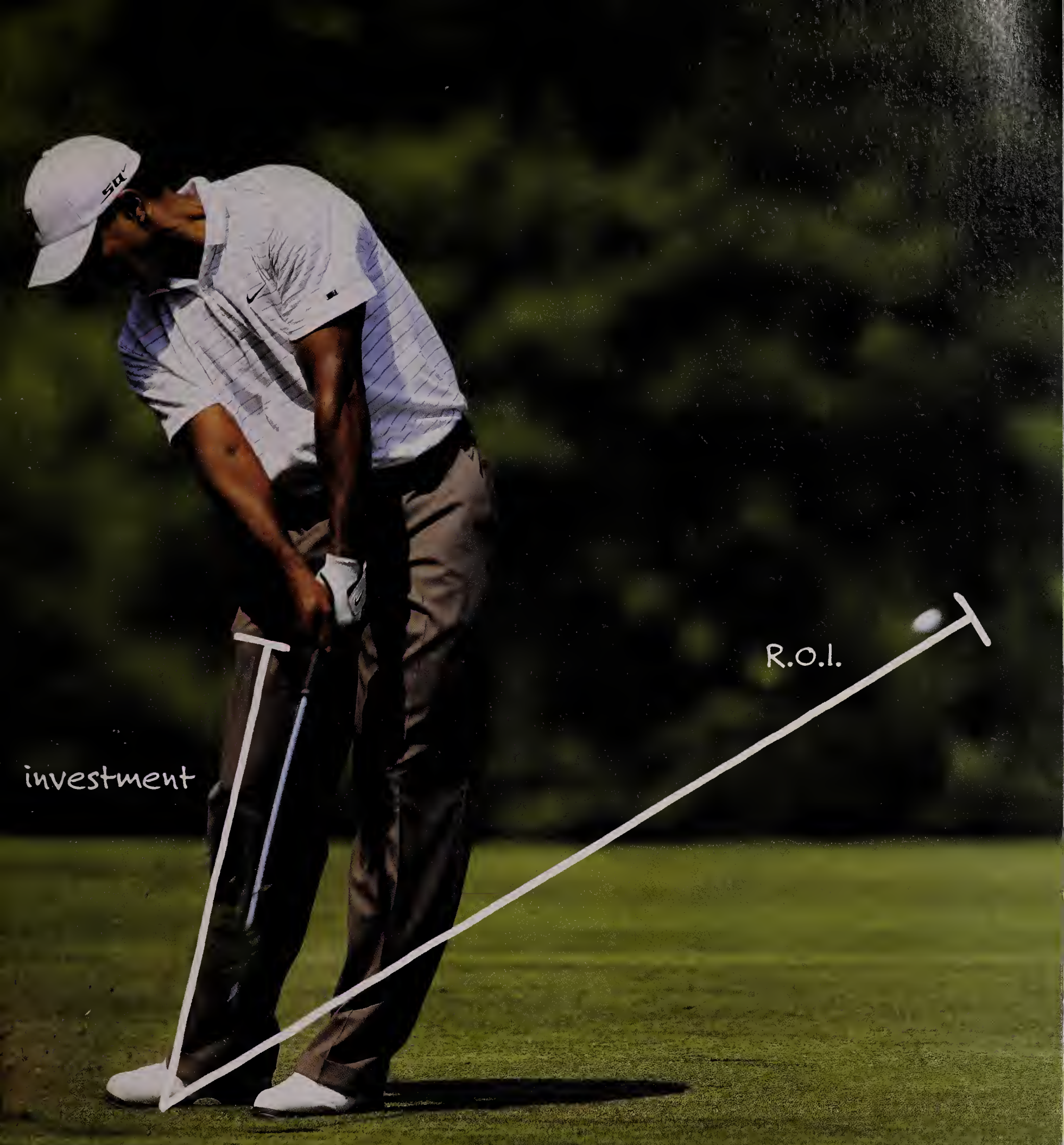

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contents

NOVEMBER 1, 2008 | VOL/22 | NO/3

Bechtel CIO **Geir Ramleth** has rebuilt his IT infrastructure according to a cloud computing model.

32

Columns

28 | Lights, Camera, Innovation?

THINK TANK What CIOs can learn from Hollywood's history of dissing new technologies. **By Scott Kirsner**

66 | The Next Generation

THE STRATEGIC CIO Who will fill your shoes? The CIO of BAE Systems' Customer Solutions group shares his method for encouraging and training potential successors. **By Robert Fecteau**

more »

51

32 | Building IT for the Future

COVER STORY | I.T. INFRASTRUCTURE How do you create a more agile, responsive and cost-effective IT department? Bechtel CIO Geir Ramleth dismantled his infrastructure and started over. **By Stephanie Overby**

51 | The CIO Hall of Fame

HALL OF FAME 2008 Meet this year's inductees who truly epitomize business technology leadership. **By Jarina D'Auria**

COVER ILLUSTRATION BY ADAM SIMPSON

contents (Cont.)

In Every Issue

8 | From the Editor
Companies need to plan today to thrive tomorrow. **By Abbie Lundberg**

10 | From the Publisher Emeritus
Great teachers will inspire kids to pick tech careers. **By Gary Beach**

13 | Trendlines
- "Shotgun" M&As put the heat on IT
- Economy dings financing for software deals
- Why corporate fraud freaks you out
- That old glass ceiling
- Center to connect on social software
- Use RFID to track servers and laptops
- Limits to in-flight Wi-Fi
- R&D tax credit extended as part of bailout
- Hot jobs: software implementation analyst

23 | Essential Technology
SECURITY Protecting data against today's threats. **By Jarina D'Auria**
SAAS Why Washington, D.C., uses Google Apps. **By C.G. Lynch**

70 | Index

72 | Data Points

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[TREND WATCH]

The End of the Software Industry as We Know It?

Change is not just a political hot topic these days. Gartner VP and analyst Yvonne Genovese identifies four emerging trends that will likely cause major disruptions to vendors as well as impact how the software industry delivers its products and services—radically reshaping IT's options.

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[LANGUAGE BARRIERS]

Six Scripting Languages Your Developers Really Dig

Groovy, Scala, Lua, F#, Clojure and Boo deserve more attention for your enterprise software development, even if your shop is dedicated to Java or .NET.

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[SECURITY]

Ten-Step Enterprise Security Programs

The complexity of today's technologies greatly increases the risks faced by businesses. These tips for building an enterprise security program (ESP) can help.

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Building the Future

Companies need to plan today to thrive tomorrow

It may seem like hubris for a 110-year-old construction and engineering company to benchmark its IT against the likes of Amazon, Google and YouTube. It might seem excessive to undertake a major IT transformation after having just completed a massive three-year overhaul that itself resulted in 30 percent IT cost savings. But that's just what Geir Ramleth, CIO at Bechtel and an admitted challenger of the status quo, has done.

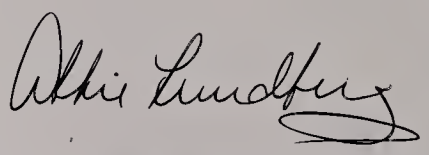
As Ramleth looked at the realities of how his company's operations were changing (more complex, more distributed, engaging more people and organizations with varying relationships with the company), he knew he'd have to take it up a notch. His ambition: to change the way IT serves business on a global basis, offering ten times the capacity at existing costs. That's right: ten times.

Seem impossible? Well, in his unconventional benchmarking, Ramleth discovered some astounding things. Bechtel was paying at least 50 times what YouTube was paying for networking and 40 times what Amazon was charging for storage. Google systems administrators managed about 200 times the number of servers that Bechtel's did. And so on. Ramleth believed Bechtel could do a whole lot better. It all boiled down to high-bandwidth networking practices, a standardized server approach, extreme virtualization techniques and a multitenant application support strategy.

Such a radical approach may not be right for you. Or maybe it is. We live in disruptive times. Every CIO should be asking himself or herself: Is this a time for incrementalism in our organization or transformation? And what do I do about that?

For Ramleth, the answer was clear. "I truly believe that we as a company can do business very differently in the future by changing the way we do our IT service offerings," he says. He convinced Bechtel's other senior leaders that if they wanted to be around for another 110 years, that's just what they needed to do.

Ramleth is one of this year's inductees into the CIO Hall of Fame. See who the other groundbreakers are on Page 51.



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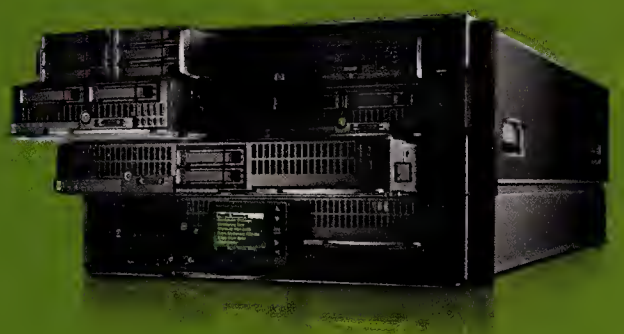

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Change IT's Image

Great teachers will inspire kids to pick tech careers

I have a homework assignment for members of the CIO community with children in elementary school.

This evening, ask your child to draw a picture of a scientist, an engineer or a technology worker other than you. Make a digital image of it, send it to me, and with your permission I'll post them on our website.

I can tell you right now that the pictures will depict geeky-looking guys with horn-rimmed glasses. Few kids will draw women. It will be easy to see the challenge facing IT's public image.

Because of this image, fewer young Americans today opt for IT careers. Meanwhile, Baby Boomers—possibly including yourself—are preparing to leave the workforce. Yet many enterprises today rely on staff with skills in both legacy systems and new Web 2.0 technology.

With the current economic crisis, older workers may stay on the job longer. But how are we to interest young Americans in IT careers? Based on my 14 years of experience as founder of Tech Corps (a non-profit that organizes technology volunteers to help in schools), the sweet spot for getting children interested in tech careers is between the fourth and seventh grades, particularly for girls.

We reach these kids by ratcheting up national efforts to find the best elementary school science and math teachers who can have a profound impact on the future career aspirations of our children. That's how we'll change the image that they have of us.

Gary J. Beach

Gary Beach, Publisher Emeritus
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NEW * HOT * UNEXPECTED

"Shotgun" M&As Put the Heat on IT

INTEGRATION Mergers and acquisitions are not usually quick affairs. Just the due diligence process of examining a company's enterprise IT systems—the infrastructure, applications, outsourcing deals and vendor contracts—can take up to a week, according to industry consultants.

But as Wall Street imploded in September, entire deals in financial services have closed over a weekend. Bank of America and Merrill Lynch. JPMorgan Chase buying Washington Mutual. The Wells Fargo purchase of Wachovia.

These so-called "shotgun" M&As are both a testament to Wall Street's dire circumstance and a test of the ability of CIOs and IT staffs to analyze, prioritize and integrate systems in a hurry. "The shotgun marriages are being arranged—and there is no IT due diligence," says Tom Casey, a vice president at Booz & Co.

That type of insight is even more important in financial services, since IT spend typically is 15 percent of overall revenue, according to Casey. *Continued on Page 14*

Economy Dings Financing for Software Deals

SOFTWARE Enterprise software investments usually involve huge capital outlays. But now that we're living in a world of financial hurt, banks won't dish out credit for such deals as easily as before.

What if your company needs financing help with software or services plans? One option, notes Paula Rosenblum, a managing partner at Retail Systems Research, is to look at software as a service (SaaS) for tech investments. "Over the short term, capital may be hard to come by. SaaS allows a company to buy only the number of transactions and horsepower it needs," she writes in a report. "Nonintrusive optimization technologies can bring rapid ROI by taking sales and order information and spitting out better assortment and pricing plans."

What if you're a software vendor who can't close deals because customers can't get financing? "Enterprise software and service vendors without proper access to credit lines may find themselves unable to close deals with clients shut out from the credit markets," says Ray Wang, a VP and principal analyst at Forrester Research. But there are solutions. He points to a deal between software maker Infor and IBM Global Financing. The deal lets customers go ahead with tech initiatives while spreading up-front payments over time, conserving cash for other investments.

Wang thinks the ability that big vendors such as IBM and others have to provide financing deals to customers is critical, given the economy. "Vendor-led financing initiatives may prove to be the lubricant that keeps tech spending moving forward," he says.

–Thomas Wailgum

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Why Corporate Fraud Freaks You Out (And It Should)

SECURITY Fraud is a fact of corporate life today, as a recent Kroll Global Fraud Report notes.

The average company's losses to fraud increased by 22 percent since last year, and the average business lost $8.2 million to fraud during the past three years. These sobering statistics are from a recent worldwide survey of 890 senior executives, commissioned by risk consultancy Kroll.

The survey found that information theft, loss or attack is the type of fraud that most worried respondents, with 25 percent feeling highly vulnerable and 47 percent feeling moderately so. And the data shows why: The fastest growing types of fraud are information theft (27 percent) and regulatory and compliance breaches (25 percent).

Yet while senior management seems to be saying they have deep concerns about fraud, they wind up underestimating the exposure their businesses actually face today.

In fact, employees working below the C-suite who are closer to an organization's technology efforts and systems are over one-and-a-half times more likely than those at the corporate level to see their companies as highly vulnerable (31 percent versus 19 percent), according to the report.

"If senior executives are not worried about their vulnerability to information theft, they should check whether their sense of safety is based on a thorough understanding of the security deployed by the company, or ignorance of the full extent of threat," notes the report. "In this case, too little knowledge could be a dangerous thing." *–Thomas Wailgum*

That Old Glass **Ceiling**

WORKPLACE A new study of 1,800 technical employees conducted by Anita Borg Institute and Michelle R. Clayman Institute for Gender Research, Stanford University, suggests gender barriers may be prohibiting some midlevel women from seeking high-level tech positions:

29% of midlevel women plan to leave high-tech companies in the next year.

34% have deliberately delayed having children to achieve career goals.

68% have limited their sleep to achieve career goals.

Mergers

Continued from Page13

"IT is the backbone of how these banks operate," he says, "and you're not going to get these major [M&A] synergies without addressing the IT stuff."

M&As are tricky to get right even in normal times with appropriate due diligence, and many don't return the expected value. According to a 2007 study by The Boston Consulting Group (BCG) of more than 4,000 completed mergers and acquisitions between 1992 and 2006, 58 percent of deals actually destroyed value for acquirers.

There are several technology-related factors that are key to M&A decision making, according to BCG's Tom Reichert, a partner and managing director. First is post-acquisition synergies. "The synergy value should be 10 percent to 25 percent of the combined technology budgets of the two companies involved," he says. "That is a significant part of the valuation of mergers."

Next is whether there are significant deal breakers—"big security or regulatory issues that the acquirer is getting into in the tech environment that really need to get solved, or big contracts that exist," Reichert says.

Booz's Casey also points to considerations such as selecting the core systems and applications that will enable the combined company to grow, and knowing where the opportunities are to consolidate infrastructure and contracts.

Workforce issues such as layoffs are less troublesome than platform and application discussions. Casey says that power is the issue here. "If I'm an IT person or business owner of [that system], then I lose that, I lose that kind of power position," he says.

The bottom line? CIOs must make do with what they inherit (IT staff, systems, projects) in a merger or acquisition. "Complaining about it," he says, "does you no good."

–Thomas Wailgum

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Center to Connect on Social Software

COLLABORATION IBM recently announced the opening of the Center for Social Software in a move that it hopes will bring more of its Web 2.0 offerings to the enterprise and allow an exchange of ideas with business, technology and academic communities.

Big Blue's Web 2.0 technologies, such as its Lotus Connections, which includes a blog and social network features, are its fastest growing software product.

"IBM has centered our infrastructure around a bigger investment in social software," says Irene Greif, director of the center in Cambridge, Mass. "We want to work more systematically and take this research and deliver it to customers."

The center will look for the best ways organizations can utilize social software and set policies around its adoption. Greif hopes those who interact with the center will give candid feedback about the company's social software. "We'd like to have people from outside working with us, too," she says.

Initial projects for the center derive from IBM labs including Beehive, an enterprise social network, and Many Eyes, a free Web-based application that allows users to visualize data in Web 2.0 formats, such as tag clouds.

While the center will mostly focus on IBM customers and software, Greif says it may work with other vendors to help provide standards around social software development.

"I am expecting to see us step in and take some leadership in that area," she says. *–C.G. Lynch*

Use RFID to Track Servers and Laptops

APPLICATIONS Accurate, well-planned and highly targeted RFID deployments in tandem with IT-driven data-integration plans can deliver substantial benefits, according to a slew of recent surveys and analyst reports.

First, a survey of 186 global organizations by ABI Research found that RFID is being used or evaluated for applications across a swathe of vertical industry sectors. "Virtually every economic sector and industry where data needs to be collected or objects need to be tracked holds the potential for RFID applications," notes ABI Research Director Michael Liard.

Organizations are also increasingly using and evaluating RFID systems to improve the tracking of objects, assets, goods and materials within corporate yards and property, on campuses and in open-loop environments, according to ABI.

Another ABI report finds RFID moving into companies' data centers. "IT assets are key infrastructure for any modern business, and IT managers need to be certain that equipment is documented, traceable and secure," notes the report. RFID "can deliver quicker, more detailed and more accurate day-to-day management of these important operational assets."

This is where RFID makes sense—high-value items that need to be tracked. "Managing and auditing this equipment is a serious pain point for IT departments, and automating those applications with RFID can drive clear ROI," states ABI principal analyst Jonathan Collins, in the report. He notes that "the density of valuable equipment within a restricted area limits the cost and increases the efficiency of an RFID deployment."

One last note comes from vendor Odin Technologies. Its IT asset tracking report shows that within the last six months, passive RFID technology delivered increased performance on servers, laptops, blades and other high-value IT assets. For instance, IT staff using RFID tags could inventory a rack of 40 servers in 12 seconds or identify all IT equipment within a typical cubicle five times faster than manual methods, with 100 percent accurate data entry. *–Thomas Wailgum*

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Limits to In-Flight Wi-Fi

WIRELESS A Delta Air Lines decision to block "inappropriate" websites from its planned in-flight Wi-Fi service could be the tip of the iceberg for airlines' control of Internet use. Delta, which will offer Wi-Fi on some planes later this year and on its domestic fleet in 2009, has decided to prevent passengers from accessing inappropriate content, according to *The Atlanta Journal-Constitution*.

In-flight Wi-Fi is emerging on a few airlines and was launched by American Airlines on a limited basis in August. Both Delta and American will block VoIP, avoiding the uproar over annoying in-flight cell phone calls. But the prospect of passengers surfing the open Web at their seats raises concerns about children and others being subjected to objectionable material, such as online pornography. Delta plans to offer the GoGo service from Aircell, also used by American. Aircell says it will implement content filtering for airlines if asked.

One privacy rights advocate criticized the idea. "I don't think it makes much sense," says Marc Rotenberg, executive director of the Electronic Privacy Information Center. It won't stop passengers from looking at inappropriate material stored on laptops, he says. It also opens the door to blocking content such as news or political opinions.

Another problem is also likely to come up, says analyst Jack Gold of J. Gold Associates. The thin, cellular-data pipe that passengers will share means airlines may have to throttle back heavy users. One person downloading a movie all through a flight could ruin the access others paid for.

Airlines are likely to guard against this in an automated way. "The flight crew are not going to be IT managers. The policies are going to have to be set and uploaded to the systems," Gold says.

–Stephen Lawson

R&D Tax Credit Extended as Part of Bailout

LEGISLATION The U.S. House of Representatives voted to extend a research and development tax credit to U.S. businesses as part of its approval of a giant bailout of the mortgage industry.

Several tech companies, including Microsoft and Texas Instruments, had called on Congress to extend the tax credit, saying it helps U.S. businesses to invest in R&D and keeps workers in the country. The credit, which would have expired at the end of 2007, will be extended for two years.

"In today's challenging economic environment, R&D is a critical catalyst for American innovation, economic growth and job creation," said the R&D Tax Coalition, a group representing the tech, manufacturing, chemical, pharmaceutical and other industries, in a statement. "The R&D tax credit motivates U.S.-based companies to keep cutting-edge research projects in the United States while funding high-wage and high-skilled jobs for American R&D workers across diverse industries."

The tax credit can cover up to 20 percent of qualified R&D spending. It has expired 13 times since 1981, despite calls by tech, pharmaceutical and manufacturing groups to make the tax credit permanent. Lawmakers have resisted making it permanent largely because of its price tag of about $7 billion a year. Some critics have called the tax credit a government subsidy for large businesses.

Several tech companies and trade groups also praised Congress for passing the larger bailout bill. Brad Smith, Microsoft's senior vice president and general counsel, said in a statement: "This crisis affects more than just the U.S. financial sector, it affects every corner of the world economy, and today's vote will help reinstill confidence around the globe."

–Grant Gross

Correction

In the October 1 Strategic CIO column, the writer's name was misspelled. The correct spelling is Karan Sorensen.

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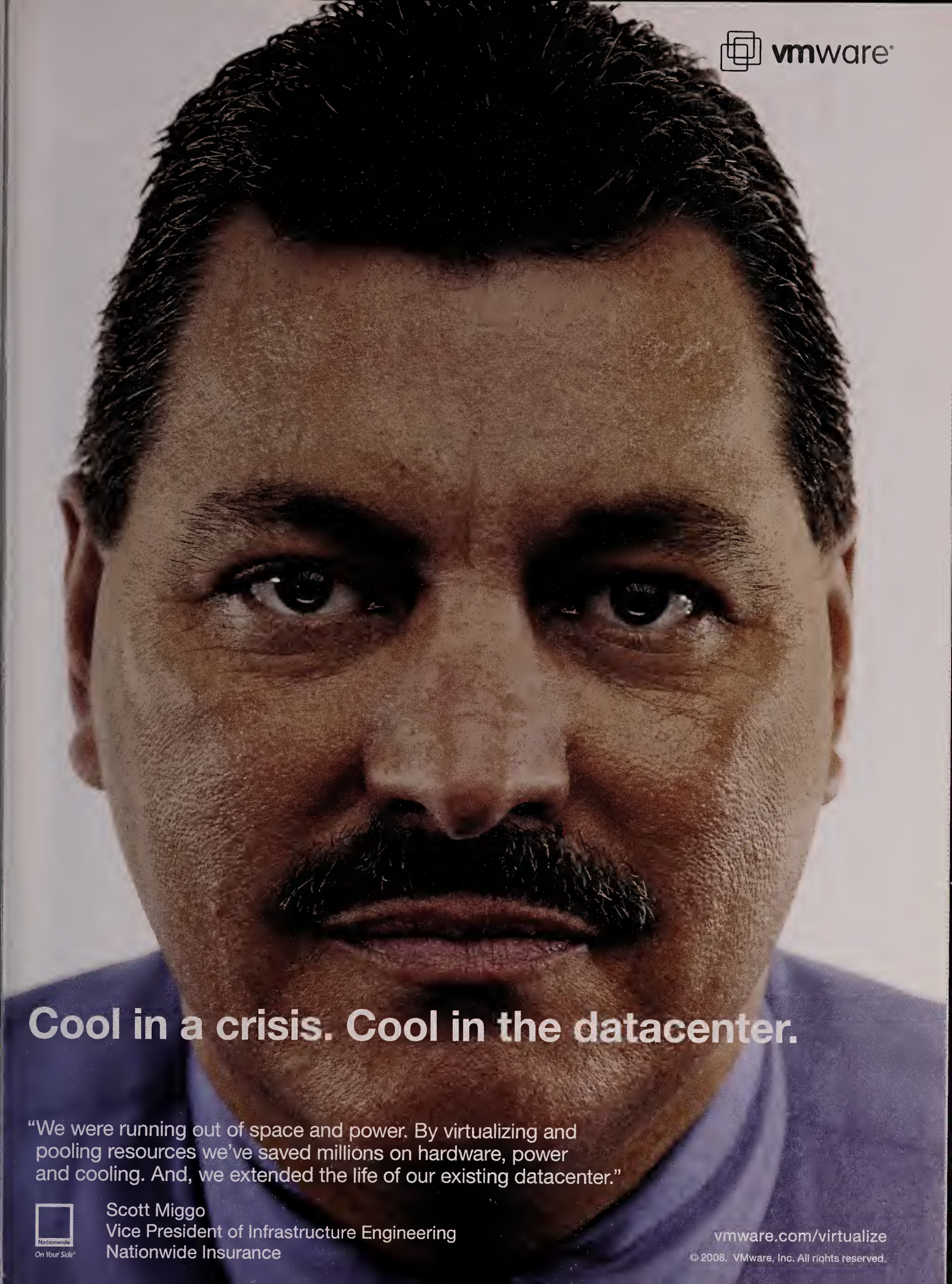
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BY **JUAN CARLOS PÉREZ**

Software Implementation Analyst

job description: The software implementation analyst ensures that deployments of new applications or upgrades are planned and carried out correctly. They act as a bridge between the software developer and the IT infrastructure team that handles installation and maintenance, says Carlo Carbetta, vice president of operations development at CIO Partners, an executive search firm. They determine whether the applications interoperate with existing systems and plan for customization or integration work. This person may be involved in testing, creating documentation and dealing with end users.

why you need one: When a company buys packaged software, it has to adapt it to its operations and processes. "If you don't have your own staffer involved in that implementation to make sure that the vendors understand your needs, you run the risk of the implementation moving off your business plan," says Eugene Farago, an account executive with the IT and metals division of Hudson, a recruitment and talent management firm. The software implementation analyst also acts as an agent of change for the company, steering it through an often risky but necessary process, he says. This means addressing user concerns while keeping the implementation on track. Finally, with IT environments becoming more heterogeneous, the need for someone with detailed knowledge of a company's business and technology increases, experts say.

salary range
$65,000 to $125,000

desired skills: Candidates should have computer, technical, engineering or science degrees, and certifications in areas such as project management and software development lifecycle. Experience with and knowledge of a company's business and technology operations are key. "This is a mid-career-plus position," Carbetta says.

how to find them: Software implementation analysts move around a lot and many do contract work, so they network a lot. Try business-oriented social networking sites like LinkedIn.

what to look for: A potential hire should be meticulous, process oriented, methodic and cool under pressure. They should be able to build relationships across the business and IT.

elimination round: Ask candidates which software platforms they are most familiar with and their experience deploying them, including the environment size. Good candidates will discuss their interaction with the infrastructure team regarding things such as hardware provisioning and bandwidth requirements.

growing your own: Groom internal candidates by rotating them through the business to gain expertise in a variety of areas. "They need to understand the bigger picture. A typical issue with implementation consultants is that they were previously a developer only and they get stuck in the details," Farago says. Putting a prospect on a process-improvement team is also a good idea. This allows you to see how quickly someone is at identifying problems and coming up with solutions, and to determine whether or not they are good facilitators.

EXECUTIVE VIEWPOINT

ADVERTISEMENT

Virtualizing Your Database Tier

HP's Strategy for Consolidating and Allocating Server Resources On-Demand

Michael Callahan,
CHIEF TECHNOLOGIST FOR STORAGEWORKS, HEWLETT PACKARD
Prior to joining HP as a chief technologist, Callahan was co-founder and CTO of PolyServe, which was acquired by HP in May 2007. He has more than 15 years of research experience in computer vision, scientific visualization, differential geometry and topology, networking and distributed file systems.

Give us an overview of HP's PolyServe solution, and tell us how it differs from other virtualization strategies.
HP's PolyServe Software works with industry-standard hardware, such as our HP ProLiant servers, to consolidate and virtualize network-attached storage (NAS) in Linux or Windows environments. With the software, information from file or database servers can be consolidated into a single, shared pool of storage that is highly available and can scale to match business demands. Unlike virtual machine virtualization where the focus is on dividing machines into smaller pieces, HP PolyServe focuses on binding a collection of physical servers or blades together to act as a single managed unit. Because we allow a cluster of servers or blades to access a common pool of data simultaneously at full speed, users can allocate resources more flexibly as needs demand.

What are the primary advantages to virtualizing the database tier?
Reducing both capital and operation costs. In consolidating servers, we make the IT environment simpler and easier to manage because we also reduce the number of software environments you have to manage. It takes dramatically less time to update software and apply patches because you're only dealing with a single copy of the operating system for each physical server, instead of one copy of the operating system for each virtual machine on that physical server. And the less time you're spending managing your IT environment, the more time you can spend on innovation.

Another major benefit is availability. Tightly coupling servers and data makes the process of reconfiguring an environment extremely complex and time-consuming when a given server fails. But with HP PolyServe, if any node or particular server fails, any other server in the cluster can immediately restart the application because they all access a single, common pool of data simultaneously.

HP PolyServe also delivers amazing flexibility. Instead of over-provisioning to meet the occasional spike in demand, HP PolyServe lets an administrator move an application from one server to another in seconds—simply by dragging an icon on the console from one column to another.

How do these advantages play in a SQL Server and SAP environment?
CIOs have always faced the tension of meeting the extremely demanding availability requirements of mission-critical applications like SAP while being as efficient as possible. Since HP PolyServe runs directly on the native hardware, we avoid the intervening virtualization layer that adds overhead and degrades performance. So we can support databases that need huge amounts of memory or that have very high I/O rates associated with them, without compromising availability or performance. You can drop a server into the cluster and attach it to the data pool without having to repartition, rebalance or perform any copy, backup and restore.

How does HP PolyServe Software complement the HP virtualization portfolio?
With the addition of database tier virtualization, HP provides customers with a full complement of virtualization tools to extend ROI across their entire IT infrastructure. Especially in mission-critical application environments, HP PolyServe Software enables the cost benefits of consolidation without compromising availability or performance. That is the essence of HP's overarching philosophy of helping IT organizations simplify their environments and reduce management complexity.

FOR MORE INFORMATION:
Check out the white paper **"Consolidating Microsoft SQL Server with HP PolyServe: The User View"** at **www.cio.com/whitepapers/hppolyserve.**

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technology

Edited by **Elana Varon**
evaron@cio.com

Protecting data against today's threats requires a combination of tools to secure networks, systems and data

Data Within Bounds

BY JARINA D'AURIA

SECURITY | When it comes to protecting data, there isn't one end-all, be-all solution. That's more true now than ever, when your most likely threat is your own employees. As more workers blur the line that surrounds the workday and bring their laptops, smartphones and other devices home, they are potentially putting their companies' data at risk. In a recent *CIO* survey, 34 percent of respondents had a security breach where their own current employee was the culprit.

Data loss prevention tools provide ways to identify risky data-handling activity and enforce a remediation action, says Jonathan Penn, VP of security and risk management at Forrester Research. Currently available software to prevent data loss addresses three levels of security: protecting networks from rogue devices, protecting systems from inappropriate access and protecting the data itself. A modern strategy to keep data secure should involve a bit of each, says Penn.

Block Unknown Devices

Deputy CIO Jeff Kuhns needed to protect the networks of 24 campuses within the Pennsylvania State University System against rogue devices—that is, any device not expected to be on the LAN. To address this need, Kuhns deployed software from Mirage Networks.

ILLUSTRATION BY ANASTASIA VASILAKIS

The software offers a traditional approach to protecting data by keeping outsiders at bay. Once installed, the Mirage system locates connected devices. The IT department can set up access policies for each device and for individuals or groups of users. The system protects data by blocking unauthorized devices from accessing prohibited data.

Such "agentless" solutions are good for organizations that have little control over the devices that end users choose, says John Kindervag, a senior analyst at Forrester. Unlike agent-based solutions, which require software on the device itself, agentless solutions reside on the network. However, as with any security tools, they can't stand on their own. "Agentless [technology] has been the primary way data loss prevention has been deployed," says Penn, "but few vendors have rich agent functionality that is unified with network scanning and remote discovery."

At Penn State, says Kuhns, Mirage software is part of "a defense-in-depth deployment of multiple systems and strategies." These include traditional security devices and software such as firewalls and antivirus technology.

From Devices to Databases

With limits to network-based protection in mind, some organizations have turned to tools that ensure legitimate users don't access data improperly. That's the problem that Nick Ray, CEO of expressHR, wanted to address.

ExpressHR helps companies in the U.K. manage temporary workers. "Our whole business is this application of sensitive data," including Social Security numbers and passport information. "If there was a security breach, it would be terminal," says Ray. Before heading up expressHR, he was cofounder and CEO of Prevx, an Internet security company.

"The biggest potential risk was from someone on the inside abusing the system and using the information for something other than work," he says. ExpressHR has tens of thousands of users (including recruiters and hiring managers) who access their database.

Ray deployed software from Secerno, which provides activity monitoring of databases. "It could learn what were normal requests from the database," says Ray. With the information the Secerno product gathered, it could automatically build rules to prevent unauthorized usage of expressHR's data.

Controlling information at the data level allows different policies to be set for individual users, not just types of queries.

The software allows systems administrators to define rules that reflect their particular database's activity. The software learns how the customer's application talks to the database—such as how many times a day a file is accessed or whether it's ever printed. Those typical queries become the basis for access policies. If data is accessed in an unusual way, the system notifies IT managers and automatically executes policies for containing the problem (such as quarantining users or locking down the data).

Ray says the biggest downside to a rule-based solution is the potential to block a legitimate transaction if a rule is improperly specified. Ultimately, he says, the risk of blocking a normal transaction is negligible.

Ensuring Usability

Once you've given someone access and have established access polices, then what? There are granular questions to ponder: Who can edit the data? Or print it? And who can distill it into a different format? Those are normal workflow questions, so it's important to figure out how people use the data when trying to implement security and usage policies.

"You could make your organization extremely secure, but at the expense of the workflow," says Ed Gaudet, SVP of corporate development and marketing at Liquid Machines, a provider of enterprise rights management software.

Companies such as Goldman Sachs and Dow Chemical use Liquid Machines software to protect intellectual property by defining not only who can use the information but also how they can use it. The software is typically used to encrypt all corporate data and lets systems administrators create access and usage rights to protect against misuse. When unauthorized users access data they don't have rights to, they get a message telling them the file is protected.

Controlling information at the data level allows different policies to be set for individual users who travel with the data, even when it leaves the network. This level of control allows security policies to be based on the type of job a person has to do. That approach maps well with collaborative workflow, says Gaudet, because role-based controls can change as workflow changes. Whatever tools you use, effective data loss prevention requires you to classify your data, a step many organizations often skip, notes Kindervag. "Until companies classify their data correctly," he says, "all data loss prevention efforts will fail."

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Becoming a TRANSFORMATIONAL CIO:

How to Overcome IT Challenges and Provide Strategic Vision to the Business

Fall 2008

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THE Transformational CIO

BY LISA DICARLO,
CIO CUSTOM SOLUTIONS GROUP

Research confirms that CIOs are becoming more strategic to the business, and transforming the IT organization in the process.

TODAY'S CIOS, faced with globalization, mergers, competition, new markets and new technologies, are becoming something akin to turnaround experts. That is, they are transforming the nature of the IT function within their organizations by improving business processes to adapt to market conditions and enable a higher degree of agility and competitiveness.

The transformational CIO is fast becoming as crucial a cog in the corporate wheel as any other C-level executive.

According to new data from IDG Research Services, 58 percent of technology executives classify their roles as transformational, and are working to become more strategic to the business. Only 23 percent classify their roles as tactical or reactive, while 20 percent say they are valued as a strategic business partner to the organization.

During the past decade, many commodity-like functions performed by IT have been outsourced to offshore providers so that IT departments can focus on more strategic projects. Tim Campos, CIO at KLA Tencor, a global manufacturing supplier, says: "By leveraging the commoditization of technology and freeing ourselves from the management of the technical specifics, it creates the opportunity for us to take greater responsibility in the business."

Tony Hashem, IT director at Genworth Financial, an $11 billion financial services firm, agrees: "IT is not going to be IT for much longer, that is, what it is today. Things like infrastructure and management of back-end operations are going to be outsourced by pretty much every organization, and IT is going to become more focused on business process, ownership and support."

The Business-Minded Tech

So what's driving IT to be more strategically involved in the business side of the house? The majority of respondents, 88 percent, say it is the need for the organization to become more operationally efficient; 69 percent say it is driven by a need for more precise business analytics that can be delivered in real time. At the same time, competition, globalization, virtualization and mergers also rank as important drivers of strategic involvement.

As with any evolution, the CIO's poses some new challenges – not the least of which is finding business-minded or business-savvy IT staff who understand the new demands of transformational IT.

"It's about having the right people in the right slot with the right business knowledge," says Keith Cooke, CIO of Energy Northwest. He says today's transformational CIOs must take a long view – 10 years – when it comes to IT planning.

"You can't just send people to training. You have to look at assignments to establih not how effective they'll be at accomplishing the task at hand, but at skills they'll gain from these assignments that are going to enable them to tackle issues that are coming two to three years from now."

Fifty-three percent of respondents characterize the level of business knowledge at their IT organizations as moderate, while 69 percent say it has increased compared with three to five years ago. That may be because CIOs are seeking technically inclined business people to fill IT staff jobs, even among the senior management ranks.

Some CIOs, like Cooke, require their staff to become an integral part of the business organization by getting involved in decision-making. Interacting with internal customers, he says, allows IT staff to increase thier business knowledge and prove their standing as a partner in transforming the business.

This is borne out in the IDG research. For istance, 77 percent say that meeting with customers to discuss needs and processes helps them become a more strategic partner; 66 percent are seeking meetings with business executives and department heads to discuss goals and objectives. These steps ensure business and IT are on the same page every step of the way.

Return on Investment

Even after a company aligns business and IT agendas, there are significant challenges – particularly when it comes to measuring the business value of IT services. In fact, 73 percent of respondents cite this area as the top challenge. And nearly half, 49 percent, report a belief that they are only somewhat effective in quantifying the value of IT services.

"By **leveraging** the commoditization of technology and **freeing** ourselves from the management of the technical specifics, it creates the **opportunity** for us to take greater responsibility in the business."

–TIM CAMPOS

"We really don't do a good job yet," says Terry Brooks, general manager at the U.S. subsidiary of Yamaha Motor Corp. "It's been a rollercoaster ride since we started to become a strategic resource in the company." Yamaha has implemented a capital expenditure process involving senior IT and business managers where metrics are reviewed periodically to see if both the business and systems objectives have been achieved. But, he admits, "We are nowhere near where we need to be."

Like other IT leaders, KLA's Campos says measuring business value is difficult, but that hasn't stopped anyone from trying. "We're trying to change the way we capture value so that we can improve the visibility into the value of what IT does. I hesitate to say that we're successful at it yet, but we do know how we're going to do it. Part of it involves working with the business partners to define value in their eyes. What problem are they trying to solve with the systems implementation?"

IT Enabling Business Innovation

Transformational CIOs are enabling innovation across the enterprise and in many cases co-leading business innovation initiatives with senior business leaders. Further, IT doesn't develop technology just because it can, and business leaders don't assign IT projects and then walk away. Technology and business leaders jointly map out a company's goals and challenges, and develop plans around them.

73% of respondents cite measuring business value of IT services as the top challenge.

49% say they have been only somewhat effective in quantifying the value of IT services.

BASE: 128 respondents

Source: IDG Research Services. To read the full research report go to www.cio.com/solution-center/cognizant

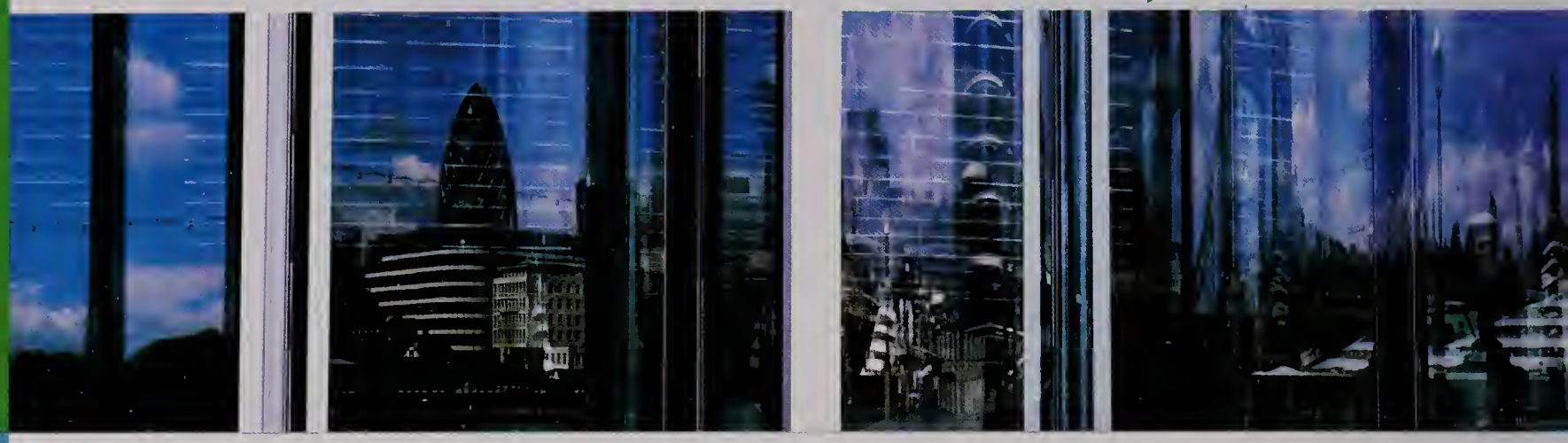
"We are co-leading the innovation effort with the business because we work very closely with the business, and we are giving them the capabilities they need to meet their strategic goals," says Genworth Financial's Hashem.

"Ten years ago when I first joined [Yamaha Motor]," says Brooks, "the only reference about IT during our annual meeting was how bad PC support was. But, in the last two or three annuals meetings we've been recognized as a strategic reason for previous-year improvement and as a key part of plans for future improvement. So we've really moved up in the world to become an important part of how different business groups are going to improve."

Providing business with the tools it needs is what makes a CIO transformative and, therefore, what makes them invaluable to the enterprise. A trusted, global services provider plays a vital role here, in part by helping an organization locate talent around the world, and infusing new ways of thinking to develop and deliver systems and services more cost effectively and efficiently. Further, because of their accumulated domain knowledge and best-practices discipline, global service providers help instill operational flexibility into a virtually distributed enterprise.

Lisa DiCarlo is a freelance technology and business writer based in Boston, Mass.

Facing an Ever-Changing IT Landscape



The list of challenges faced by CIOs is constantly evolving and never-ending. BY LISA DICARLO, CIO CUSTOM SOLUTIONS GROUP

GLOBALIZATION, operational efficiency, new technologies, security, mobility, mergers, and competition present technology executives with hurdles over which they can trip at any time. CIOs are tasked with conquering these challenges, and doing so with the same or fewer resources.

How can CIOs overcome challenges while becoming a more strategic partner to the business, and helping to improve business processes? The answer is that they can't do it alone. A global services provider can help by mapping to a company's global footprint; delivering seamless IT and business process outsourcing services; providing visibility throughout the enterprise with a virtually distributed platform; being empowered to instill innovation and flexibility into a global enterprise.

Trends in outsourcing bear this out, as enterprises outsource commodity IT functions so that they can focus on more strategic initiatives. According to a recent survey by IDG Research Services, 75 percent of CIOs are outsourcing application development and hosting, and 64 percent are outsourcing IT infrastructure including security, help desk and data center operations. To a lesser degree (43 percent), CIOs are also outsourcing business processes including accounting, finance, human resources, and customer service.

Operational Efficiency: IT's Biggest Challenge

Global enterprises are increasingly entrusting service providers with mission-critical IT and business process optimization initiatives. Given ongoing cyclical and secular economic pressures, and the proliferation of mega-trends such as mobility and cloud computing, many companies are turning to global services providers to enable more cost-effective and efficient ways of running their businesses. Indeed, overwhelmingly, CIOs cite operational efficiency as the most important trend driving the need for more strategic involvement from IT.

Many technology executives are working to improve the global delivery of IT services to sharpen their competitive edge and improve business operations. "In terms of IT transformation, we're streamlining infrastructure and shared platforms, and making improvements in ERP for IT processes – how we meet demand, manage our finances and do global incident handling," says David Buckholtz, vice president of planning, enterprise architecture and quality at Sony Pictures Entertainment.

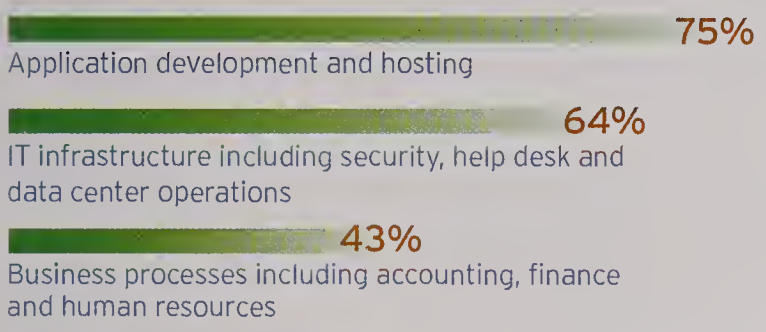
Operational efficiency can give a company an edge by enabling it to execute faster and more cost effectively.

For instance, being operationally efficient is helping Appleton Papers, a Wisconsin-based paper manufacturer, scale its infrastructure in advance of business needs. "If you're launching a new product or service, IT should have a structure to easily scale up to deliver it, then scale down and build a governance model, which is not only scalable from a delivery perspective, but can also drive innovation and accelerate business while controlling cost," says Satish Dave, executive director of IT at Appleton.

When operational efficiency has been achieved, IT organizations can focus on becoming a better business partner by developing innovation strategies that can contribute to revenue or profit goals.

"We've transformed ourselves into what I would consider to be a more strategic partner, mainly through the revamping of our entire IT platform, from a legacy mainframe to a distributed systems environment," says Brent Littleton, vice president and chief technology officer at Security Benefit, a diversified financial services firm. "That freed up our time to be able to focus more strategically, and not tactically."

IT FUNCTIONS THAT CIOS ARE OUTSOURCING



Source: IDG Research Services
To read the full research report, go to www.cio.com/solution-center/cognizant.

Challenges of Globalization

Global expansion opens new sales and distribution channels and can help lower costs through labor and intellectual arbitrage. But, how do you find the right skills, ensure consistent services delivery and provide visibility and real-time collaboration throughout a global enterprise?

CIOs need an efficient method to manage and share knowledge, and enable real-time collaboration. This sort of knowledge-sharing platform would alleviate a problem that IT executives have in becoming more strategic partners to their business: 59 percent of CIOs surveyed by IDG Research say they have significant challenges putting frameworks and processes in place across various regions.

No discussion of CIO challenges would be complete without mention of an IT skills shortage, particularly specialized skills. In the United States, this challenge is becoming acute. Executives are looking overseas, but a global talent search has its own challenges, such as where to look and how best to tap into the region.

That's where global services providers come in. Sixty-three percent of respondents say they rely on outsourcing partners to help gain access to specialized IT skills. In fact, 90 percent say access to highly skilled resources is the most important quality in an outsourcing partner, and 45 percent say this access need has increased in importance over the last several years.

CIOs should look for a global services provider to help them overcome a skills shortage by leveraging intellectual arbitrage, which seeks to find the best talent possible, wherever it may be, to achieve results that were previously unattainable.

Other Challenges

The alignment of business and IT goals and agendas is still a work in progress at many companies. That highlights another IT challenge: being empowered to help bring business innovation to the enterprise. Again, this is where a top-tier services provider can help.

In the IDG survey, CIOs report the top qualities they seek in an outsourcing partner are responsiveness, dependability, flexibility, and a collaborative approach. In addition, 60 percent say it would be extremely or very valuable to have a senior business consultant from their outsourcing partner's team on site – available and accountable to senior IT and business staff. Seventy-eight percent say it would be very or extremely valuable to have a dedicated offshore manager who is responsible for all the deliverables, regardless of where the work is performed.

When a global services provider brings these qualities and offerings to the table, CIOs are better able to help their own companies achieve IT and business alignment.

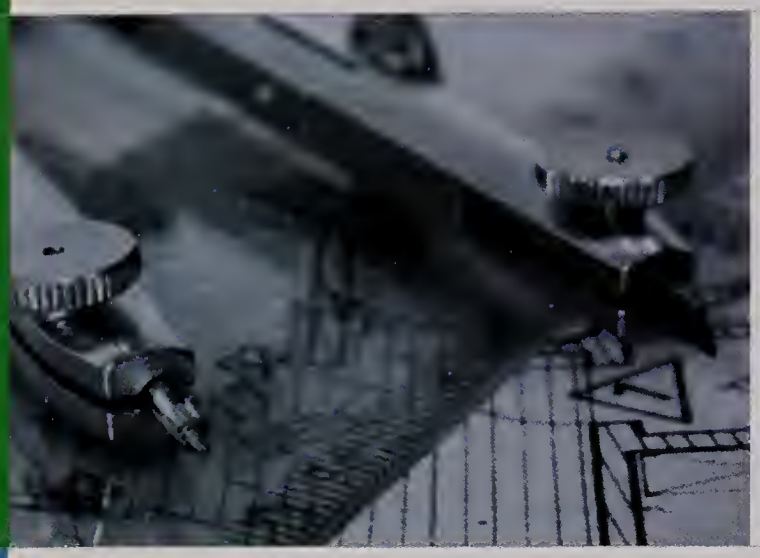
Today's global companies are in a state of perpetual motion, fed by IT organizations in a state of perpetual evolution. "Every year I tell my team, 'next year has to be easier,'" says Terry Brooks, general manager at the U.S. subsidiary of Yamaha Motor. "But it's a constant cycle of change."

Refined global services delivery can clear the path for CIOs as these new cyclical challenges crop up.

Lisa DiCarlo is a freelance technology and business writer based in Boston, Mass.

GLOBAL IT SERVICES:

How to Measure the Return on Outsourcing



EXECUTIVE SUMMARY:

A thorough analysis of an outsourcing relationship can provide CIOs with insights into projected costs, savings and operational benefits. This white paper examines:

- How Cognizant's Return On Outsourcing methodology documents existing and long-term cost benefits.
- Why working with a vendor that commits to measuring ROO is critical to achieving superior business outcomes.
- How Cognizant's ROO tool can help guide future investments in outsourcing to maximize long-term success.

THE REASONS ARE VARIED, but the trend is clear. Global outsourcing is now a crucial element of corporate IT strategy. Businesses turn to outsourcers to contend with budget cuts, IT talent shortages and the need for domainspecific or technical expertise.

Cowen and Company[1] estimates that offshore spending as a percentage of IT services budgets jumped from 12 percent in 2005 to 19 percent in 2006. The offshore outsourcing market grew 30.7 percent in fiscal year 2006-2007, according to NASSCOM, India's IT services and software organization.[2]

It's not just about growth. Outsourcing is in transition, and is becoming more strategic. "Our findings confirm that outsourcing has matured beyond cost reduction to become a way for organizations to better access talent and capabilities, gain more flexibility, reinvent their business model and drive innovation," notes PricewaterhouseCoopers in a report on its 2007 Global Outsourcing Survey.[3]

The decision to outsource may seem easy. The challenge for corporate decision makers is in selecting a partner that will commit to identifying, measuring and achieving business value throughout an outsourcing agreement. This starts by hiring a firm that can create a clear blueprint for measuring return on outsourcing (ROO) on a retrospective and forward basis – and then work in lockstep with your IT organization to continue to exceed existing metrics that lead your business to new horizons.

Understanding ROO requires enterprises to take a 360-degree view of IT activities and their connection to the business. It is a process that not only calculates the initial labor savings accrued from outsourcing IT but gauges the overall business value generated from a properly conceived and executed IT services engagement.

Calculating ROO

With Cognizant as a partner, the ROO process starts with a deep dive into IT costs. Internal costs are compared with fees incurred as a result of the outsourcing of IT services. A picture emerges of the potential savings that can be gained from outsourcing IT activities from leveraging the economies of scale, best practices in IT service delivery and domain experience. From there, Cognizant strives to work more strategically with clients to tighten alignment of IT strategy with business goals and apply cost savings to building new systems that fuel business innovation.

For Cognizant, that deep dive is performed with a proprietary tool built to measure the existing and projected business value delivered by outsourcing various IT activities on a project or programmatic basis. The tool, built with the assistance of Forrester Research, provides

two different, but equally important, dashboard views.

The first view, the Financial Dashboard, details costs savings that can be realized over time by calculating how changes in labor and technology infrastructure expenses impact financial performance. The Financial Dashboard highlights the impact IT spend has from:

- Operational Flexibility (business options and efficiencies)
- Business Value (top- and bottom-line benefits)
- Total Cost of Ownership (including IT services fees)
- Risk and Uncertainty (in terms of current delivery strategy and alternatives)

The second view, the Performance Dashboard, shows:

- Comparative Benchmarks that assess the client's performance against its particular peer group or best-of-breed companies outside of its vertical industry
- Best Practice Comparative Estimates, from which recommendations can be made for improving performance

For many organizations, an ROO analysis may reveal a gap in strategic planning. A recent KPMG International study of 650 companies notes that more than 40 percent of sourcing contracts are not supported by formal strategic measurement beyond the management of service level agreements. Moreover,

The challenge for corporate decision makers is in **selecting a partner** that will commit to identifying, measuring and achieving **business value** throughout an outsourcing agreement.

79 percent of respondents said they did not accurately know the costs associated with selecting a sourcing provider.[4]

Let's look at one example of where an ROO analysis can help a business both in cost savings and revenue growth – application development.

A decision to outsource application development typically considers an organization's existing staff costs, whether for full-time employees or contractors, and extends those costs over the project lifespan. The IT team also considers post-implementation maintenance and related infrastructure expenses, and then maps all those costs against projections for increased revenue.

However, an ROO analysis cannot stop there. Management must consider the IT team's track record in terms of budget overrun and delays resulting from changing requirements. Outside of IT, significant changes in project scope and ongoing user review affect productivity within the business units.

An ROO analysis conducted with a strategic partner such as Cognizant provides an opportunity to examine the internal IT team's skill sets, such as Java and .NET expertise, and experience with advanced Web-oriented development methodologies for building a set of applications to support a business line extension.

An ROO analysis also looks at how the organization can increase alignment of its IT strategy with business objectives to reach better outcomes. It shows management how they can reallocate IT resources to focus on strategic, revenue-based projects by outsourcing more routine, standardized tasks to a service provider whose global experience and infrastructure provides safe, secure and efficient support.

The Cognizant Edge

An effective ROO analysis with Cognizant takes a thorough look at a broad range of costs and benefits that may often be overlooked, and then leads the business to examine whether there is a better way to build the best application that will drive the organization forward. The entire process offers a new view of the IT organization and the potential game-changing outcome of an efficiently managed and executed outsourcing relationship. It's a 360-degree view that takes in all aspects of the organization and the outsourcing partnership.

"When you bet your business on an initiative that is as complex as a new application you can't afford to take a snapshot look at costs and benefits. A 360-degree view allows management to identify organizational strengths, barriers and dependencies that could impact the project, as well as opportunities to quickly deliver better applications – and savings or revenue," says Malcolm Frank, Senior Vice President and Chief Strategy Officer for Cognizant.

1 Cowen and Co., "March '07 Q. Offshore Survey, Increasing Market Penetration, Pricing Uptick." April 2007.

2 NASSCOM annual survey on the performance of the Indian software and services sector, July 2007.

3 PricewaterhouseCoopers, "Outsourcing Comes of Age: The Rise of Collaborative Partnering," May 2007.

4 KPMG International. "Strategic evolution: A global survey on sourcing today." 2007.

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The Business Case for Gmail in the Enterprise

Why the Washington, D.C., government is migrating its 38,000 employees to Google Apps.

BY C.G. LYNCH

SAAS | On September 11, 2001, Vivek Kundra began his tenure in government IT as director of infrastructure for technology with Arlington, Va. And the terrorist attacks that took place on his first day made him realize how storing all information on premise had its pitfalls.

"What we realized after those attacks was that if we had our one main data center shut down, we wouldn't be able to support government," he says.

Today Kundra is CTO of the District of Columbia, and says his time in government has led him to switch government employees over to Google Apps for two reasons: the cheap price tag and his belief that they can ensure business continuity and data security.

"In D.C. government, the schools spent $25 million on PeopleSoft and it failed," he says. "That's $25 million down the toilet. Government needs to start asking the question, Are we building an IT organization? Or, do we want to move out of the system of owning hardware and get services to deliver solutions to customers faster? We spend far too much on enterprise software roll-outs."

When he took over as D.C.'s CTO, Kundra decided that "moving to the cloud"—having corporate applications delivered by a third party—would have merit. A company such as Google has so many data centers that it would ensure better business continuity and security.

"Their data centers are geographically dispersed," he says. "That was attractive to me from a security perspective."

And the enterprise version of Google Apps, a software suite that includes e-mail, calendar, documents and spreadsheets, wikis and instant messaging, costs a mere $50 per user per year. When Kundra thought of deploying it across the 38,000 employees and 86 agencies that his department supports for technology, he saw immense cost savings.

"The average cost of [enterprise] e-mail is eight dollars per month [per user]," he says. "For [almost] half that, we get value beyond just e-mail."

> We spend far too much on enterprise software roll-outs.
>
> -Vivek Kundra, CTO, District of Columbia

Working Smarter

Kundra found additional value in Google Apps through productivity improvements. To demonstrate the value of Google Docs and Spreadsheets, for example, Kundra recently used the app to work on a performance plan with his deputies. Instead of e-mailing around an attachment for their input, he created a Google Doc which allowed his deputies to make suggestions in real time while maintaining a single active document, stored on a Google server, with the latest revisions.

Kundra also believes that users will be predisposed to using Google Apps because, especially from an end-user perspective, it mirrors technologies they may already use at home.

Many D.C. agencies have also begun using Google Sites (built on wiki technology), which can be used by people with no programming experience to build websites, Kundra adds.

Kundra has rolled Google Apps out to all 38,000 employees. He expects to pursue more software-as-a-service applications in the future to further improve services while curtailing costs.

"Why should I spend millions on enterprise apps when I can do it at one-tenth of the cost and ten times the speed?" he says. "It's a win-win for me." CIO

Online Staff Writer C.G. Lynch can be reached at *clynch@cio.com*. To comment on this article go to *www.cio.com/article/450636*.

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SCOTT KIRSNER

Lights, Camera, Innovation?

What CIOs can learn from Hollywood's history of dissing new technologies

The movie industry is full of prima donnas, overpaid incompetents and people who talk endlessly just for the pure pleasure of it. Nothing like your industry, is it?

Hollywood, with its glittery red carpet premieres, may not seem to have much in common with banking, health care or auto manufacturing. But I believe it shares a key trait with *every* large, well-established industry: how it responds to new business models and technologies.

For more than a century, every time an important innovation knocked on Hollywood's door, the industry treated it like a homely auditioner—giving it the cold shoulder and trying to show it the door. The movie industry ignored or tried to stave off sound, color, television, home video, computer animation, and digital editing and cinematography before realizing that each revolution would help grow the business, ensure its cultural relevance and expand the creative possibilities.

New ideas always threaten the status quo. Businesspeople worry how they'll affect today's predictable revenue streams. Everyone else worries about how they'll affect their standing in the organization: "Will I be less of an expert when this new tool or technology takes over?"

When innovations arrive in an industry, they split it into three groups: innovators, preservationists and sideline-sitters. The innovators develop, support and find applications for these new ideas. Preservationists seek to preserve the status quo, often battling the innovators. The sideline-sitters simply wait to see how things will pan out.

CIOs, in my experience, can find themselves in all these roles. Sometimes a CIO is an advocate for a new technology or business model; sometimes she's on the sidelines or campaigning to preserve the status quo. The CIO might lead the charge on storage virtualization, watch a standards battle play out or explain to sales why storing company data on a new Web-based application is a bad idea.

Here are the behind-the-scenes stories of three

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movies that marked turning points in Hollywood's technological history. Each offers lessons for anyone trying to identify or introduce powerful new innovations.

Every time an important innovation knocked on Hollywood's door, the industry treated it like a homely auditioner and gave it the cold shoulder.

Take one: Embrace risk.

Most cinephiles remember *The Jazz Singer*, starring Al Jolson, as the 1927 movie that brought synchronized sound to the silver screen. Few recall that others, including Thomas Edison, tried earlier to link the pictures on screen with a sound track. But the technology wasn't good enough—the audio wasn't clear, or it veered out of sync—so most people concluded that movies were meant to be silent forever.

But the Warner brothers were persuaded to explore a new technology developed at AT&T's Bell Labs. The technology, dubbed Vitaphone, was far from perfect. It relied on easily scratched records (new ones had to be shipped to theaters weekly). The projectionist had to be an expert at changing film reels and cueing the record at precisely the right moment. But the technology was just good enough to deliver a thrilling new experience to audiences—especially when Jolson shouted, "You ain't heard nothing yet, folks!"

The Vitaphone technology was eventually replaced by something more reliable. But adopting it catapulted Warner Bros. into the top tier of movie studios. Net profit jumped from $2 million in 1928 to $17 million in 1929, the year the studio received an award at the first Oscar ceremony for helping to introduce talkies.

The lesson: Innovation and smart risk-taking go hand in hand. After everyone concluded that audiences didn't want to watch movies with sound tracks, and that the technology wasn't good enough, the Warner brothers proved the conventional wisdom wrong. Their willingness to take a risk to innovate enriched their business and helped turn the movies into a truly mass medium.

Enabling Innovation

To read about **WHY INNOVATION SHOULD BE THE CIO'S JOB**, go to **www.cio.com/article/27977**.

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Take two: Pay attention to the customer.

Hollywood studios scrambled in the 1950s to respond to the new medium of television, which delivered free entertainment to American living rooms. Many of the strategies involved offering an experience that couldn't be duplicated at home: movies in 3-D, Smell-o-Vision and Cinerama, which relied on three projectors (and an army of projectionists) to create a panoramic, immersive image on the screen.

One technology that stuck was CinemaScope, developed by 20th Century Fox. It succeeded because Fox's president had been a theater owner and understood how acutely cost-conscious they were. The technology was cheaper and simpler than its competitors (relying primarily on a special projector lens that expanded the image across a wider screen). Fox offered it in two flavors: one with standard monaural sound, and a pricier version with four-channel surround sound. Its first movie to employ the technology was *The Robe*, a biblical epic starring Richard Burton. Within a year of its release, about half of U.S theaters were equipped to show movies in CinemaScope, and every studio—aside from Paramount—had licensed the technology from Fox.

The lesson: Innovations like Cinerama may have been more dazzling than CinemaScope, but simplicity and low-cost often create an insurmountable market advantage. Understanding the user's mind-set is also crucial.

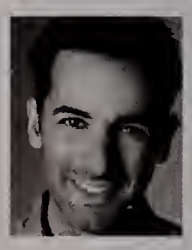
Take three: Build buy-in.

As he revived his *Star Wars* franchise, George Lucas decided to explore digitally projecting *Star Wars Episode I: The Phantom Menace*, so the movie's 1,000th showing would look as good as the first. He turned to projectors from Texas Instruments (TI) and Hughes-JVC.

Today, almost 100 percent of the digital projectors in U.S. movie theaters rely on technology from TI. The Hughes-JVC projector proved temperamental, but TI also had a better strategy for winning industry buy-in. It held a series of demos at which directors and cinematographers watched movie clips shown with prototype projectors and gave feedback. After each demo, TI improved its digital light processor technology and brought it back for another round.

The lesson: Win stakeholder buy-in before implementing something new. Dropping a technology on users without letting them influence how it works is a recipe for disaster.

Today, Hollywood is trying to assess how the Internet and devices like cell phones and the iPod will affect the business. Many are in full preservationist mode, complaining that cinematic spectacles don't look very good on a Saltine-sized screen. Getting behind the right innovations, I'd argue, is what will ensure the industry's continued profitability and survival. And that's not too different from the role a CIO plays in his company. CIO



Freelance writer Scott Kirsner is the author of *Inventing the Movies: Hollywood's Epic Battle Between Innovation and the Status Quo*. To comment, go to *www.cio.com/article/454917*.

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BUILDING FOR THE FUTURE

ILLUSTRATION BY ADAM SIMPSON

How do you create a more **agile**, **responsive** and **cost-effective** IT department? Bechtel CIO Geir Ramleth dismantled his infrastructure and started over.

BY STEPHANIE OVERBY

CALL IT THE CIO "CLEAN SLATE" FANTASY.

If I were starting from scratch, what kind of IT systems would I build to support my business today?

For most IT leaders, bound by long-standing infrastructure choices and loads of legacy systems, it's little more than a parlor game. For Geir Ramleth, however, the question provided the foundation to a new model for delivering corporate IT services.

Ramleth isn't the IT leader for some hot, new startup. He's the senior vice president and CIO for Bechtel, the construction and engineering company that got its start 110 years ago building America's western railroads and later made a big splash helping raise the Hoover Dam. "We said, If we started Bechtel today, would we do IT in the same way we're doing it now?" says Ramleth. "The answer was no."

When Ramleth first asked the question more than three years ago, the company had

Reader ROI

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A Road Map for Next-Generation Data Center Success, drawn from experience

John Bennett
WORLDWIDE DIRECTOR, DATA CENTER TRANSFORMATION, HP

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There are plenty of opportunities to acquire new technologies and take on new initiatives to improve your data center. But how do you know which initiatives to invest in, the order in which to place your data center projects or which technology purchases are appropriate for your organization? CIO recently caught up with HP's Bennett to discuss the stalwart technology company's vision for data center transformation (DCT).

What first steps to DCT do you recommend to CIOs?

One first step is working out the definition of the right type of next-generation data center (HP refers to this as an Adaptive Infrastructure) that will meet your business goals and priorities in the future. That's a process that involves a lot of working meetings among the IT organization, business managers, CEO, and CIO. In the end, DCT is going to work if the resulting architectures are truly aligned and optimized for business strategies and plans—and business executives support it. The next step is a deep and thorough analysis of what you've got and how you work and manage resources and components in the IT organization. That provides the road map that leads to a successful transformation of the data center environment.

> "With transformation, we are looking at benefits across the board—from business benefits to IT benefits—and how to achieve them in parallel."

Why should CIOs consider implementing DCT?

The issue for many people is that changes in business are driving them to rely on IT in different ways. They're expecting an IT organization to manage business growth, reduce costs and mitigate risks. This creates a dilemma for most organizations: How do I do all three at the same time? If I just focus on one, I'm probably not going to accomplish the other two. That is the value of DCT. Transformation takes a strategic look at the data center, and works to identify a next-generation data center that is appropriate for each business, its strategies and its industry. A set of projects that addresses the pain points of the organization should be integrated over time. In the end, our customers say they're seeing 25 percent to 50 percent reductions in operations spending.

What are some roadblocks to transformation? How can CIOs mitigate?

Probably the biggest roadblock is lack of executive buy-in or lack of senior management buy-in. If you don't have that, it's going to be very difficult to do a business-wide transformation. And if you don't have that, it's going to be very difficult to get approval for capital investments in your data center facilities. Those roadblocks can be mitigated by undertaking transformational projects that only touch one or two business units. For example, there may be a couple of business units that are keen to have some of the savings. By cherry-picking the individual starting projects, you can demonstrate that first, the approach has merit; second, you are capable of executing it; third, the results promised are valid.

What are the benefits of transformation, and how do they differ from traditional IT projects, such as consolidation or virtualization?

Traditional IT projects usually have a specific goal in mind, and the vast majority of them are focused on IT-related benefits. Take consolidation, for example. Most consolidation projects are about saving money, and usually they are about saving money for IT budgets and related costs. With transformation, we are looking at benefits across the board—from business benefits to IT benefits—and how to achieve them in parallel.

What has HP done to transform its own data centers?

There were five initiatives that were undertaken to transform HP IT. One focused on global data centers, which (involved) data center transformation as we've discussed here. We went from an environment that had 85 worldwide data centers to one that has six next-generation data centers in three locations. We increased processing power by more than 80

Business outcomes from implementing next-generation data centers

- Align data center resources to business needs and plans
- Optimize the use of data center resources
- Cut capital, real estate and operational expenditures
- Reduce redundancies, increase asset utilization and improve operational efficiencies
- Increase resource availability for innovation and business growth
- Reduce disruption of technology-supported business processes
- Improve quality of service
- Enhance management and automation to reduce human errors and service disruptions
- Enable standardized and compliant data centers
- Integrate facility and technology strategies to achieve scalable data centers and operational continuity

Source: Hewlett-Packard, "Speeding business innovation with HP Data Center Transformation solutions"

percent; we reduced energy costs by more than 60 percent; we reduced networking and communications costs by more than 50 percent—and, in total, we have realized more than $1 billion in annual savings.

Do you recommend the type of aggressive approach to transformation executed by HP?

HP's own IT transformation took three years. We did many projects in parallel. It also took into effect all HP IT, not just the data center and data center strategy. Our CIO argues that you get the highest ROI on transformation if you do it in that fashion. Most people are probably more risk-averse than that, and DCT can be spread out in time frames that are appropriate for their own risk profile as well as the availability of capital to jump-start projects. Once up and going, these initiatives all have cost savings themselves and projects can become self-funding after a while. So you don't have to take the aggressive HP approach, but there's clearly value in getting it done more quickly.

What particular drawbacks to a traditional, serial technology initiative approach should CIOs be aware of?

The drawback of approaching them serially is that you tend to get all your benefits focused in one particular area, not all three. We also need to take into account the time value of money, and serializing these projects can significantly reduce your expected ROI. And that highlights another problem with the traditional approach, which is that you'll likely see higher costs becausc you haven't integrated or dovetailed the projects together. You don't have the opportunity to have the benefits of one project actually reduce the starting costs of the next one.

> "It's critical to personalize the next-generation data center for the industry and the competitive environment in which an organization is operating."

How does transformation best align with the specific business goals of individual companies?

It's critical to personalize the next-generation data center for the industry and the competitive environment in which an organization is operating. The needs of a company in the transportation industry, for instance, are very different than the needs of a company in financial services. And because the strategies of organizations vary, and the nature of the competitive environment changes from one market to another, there is no one-size-fits-all approach to DCT. Bottom line is that it's key to make sure the business goals drive everything else.

In what ways does transformation help IT leaders optimize strategic technology investments?

One of the challenges for customers is the fact that there's an opportunity-rich environment to invest in new technologies such as blades, energy-efficient solutions, innovative power and cooling solutions, virtualization, automation, and service management. It's an interesting list of capabilities. But how do you know which technology investments make sense for you? How do you know how implementing one of them would impact other areas—for the good or for the bad—in the data center? How do you know which of them is likely to have the highest impact on the goals of the business, and of the IT organization? Transformation will help you optimize your technology investments because we are looking across the data center comprehensively. We're bringing to bear all of these technologies, because they all play a role in the next-generation data center. But now they're doing so in a way that maximizes the outcomes for the business—and brings them in at a point at which it makes the most sense.

FOR MORE INFORMATION:
Download a copy of the HP white paper titled **"Speeding business innovation with HP Data Center Transformation Solutions"** at **www.cio.com/whitepapers/HPtransformation.** Further information may be also be found at **www.hp.com/go/dct.**

Bechtel CIO **Geir Ramleth** believes that the software-as-a-service model for application delivery will enable the company to deliver new information-based services to clients.

just completed a major initiative to streamline IT systems, which had cut costs by nearly 30 percent. But with Bechtel's projects increasingly executed in far-flung geographic locations, from Santiago to Shanghai—and with its systems being accessed by thousands of temp workers, customers, even competitors—Ramleth knew a more drastic shift in how IT services are delivered would be necessary to support the company's complex, distributed business model.

Starting with that imagined technology "tabula rasa," Ramleth took his cues from some real-life IT pioneers who, unlike most corporate IT organizations, could take advantage of an actual clean slate when building their technology platforms. He incorporated high-bandwidth networking practices from companies such as YouTube, the standardized server approach of Google, extreme virtualization techniques from Amazon, and the multitenant application support strategy of Salesforce.com, among others.

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The result is the Project Services Network (PSN), an infrastructure to apps overhaul of Bechtel's technology environment that Ramleth says will provide secure, ubiquitous, simplified and rapidly deployable access to corporate and customer information for any user around the globe who needs it. Ramleth calls his approach the "consumerization of the computing environment"—an internal cloud-computing infrastructure serving up in-house applications on demand. Others say it's a sign of the IT times.

> **"IF YOU SAY THE IDEAL WORLD IS WHEN EVERYTHING IS DONE AS A SERVICE—COMPUTING, STORAGE, SOFTWARE, X-AS-A-SERVICE—AND YOU LOOK AT WHERE ENTERPRISES ARE TODAY, WE HAVE A LONG ROAD TO GO."** –GEIR RAMLETH, CIO, BECHTEL

"It's really in vogue right now if you're overseeing enterprise IT to look at these upstarts that are talking about how they run hundreds of thousands of servers," says Howard Rubin, president and CEO of Rubin Worldwide and a Gartner senior advisor. "As corporate IT bemoans the issues of virtualizing or large-scale standardization, these younger companies do it all as a matter of course. CIOs are starting to wise up and look at what they're doing right."

An Old Company Needs New Tricks

"That's not our business. That's not what we do."

That was the reaction from Bechtel's corporate management when Ramleth came to them with his big idea: To benchmark IT not against construction or engineering industry peers—or even global enterprises of a similar size—but against successful companies in the Internet consumer space. They couldn't immediately imagine any benefit in dedicating time and money to imitating an online consumer company.

It took time and targeted marketing to get the C-suite to warm up to the idea. "I needed to get them to understand that we didn't want to be a Google or an Amazon. We wanted to understand how these guys do things so we can learn from them," explains Ramleth.

By 2006, Bechtel was operating in more locations than ever. And for every 100 employees in the U.S. and Europe who retired, the company had only been able to replace 60. "We have to chase the talent around the world," says Ramleth. "That's why we have [corporate] operational centers in Shanghai, Taipei, Bangkok, New Delhi, Mumbai and Warsaw." At the same time, Ramleth found that a third of the people accessing Bechtel's network were non-Bechtel employees, creating a huge intellectual property risk.

The situation was leading to an untenable IT environment. Bechtel wasn't only inviting all manner of nonemployees onto its network. IT deployments took dreadfully long: 30 days to put support in place for a new business project. That was a problem Ramleth's corporate peers could understand. "We didn't want our projects to have to wait for us," Ramleth explains.

Ramleth knew Bechtel needed a faster, simpler and more secure way to deploy and support IT applications. For starters, he needed applications he could deliver via the Internet, not Bechtel's intranet (an approach Ramleth's team had taken in building one-off IT systems for two multibillion dollar oil and gas projects in the past). But after several months of trying to tackle the problem by rewriting scads of existing applications, Ramleth realized something more fundamental had to change.

Rewriting all of Bechtel's 200-plus applications—40 percent of them built in-house—was crazy. "It would be too costly, and wouldn't solve everything," Ramleth says. "We needed to shed ourselves of all of the thinking that got us to where we [were]," says Ramleth. "We had to start from the infrastructure up."

To figure out what a new IT backbone might look like, Ramleth and his team followed the money. Ramleth interviewed venture capitalists and learned that they were betting 80 percent to 90 percent of their investments on consumer-related tech, with the remaining sliver of funding going to enterprise IT. "If that's where the investment is going, they [consumer technology companies] are doing something that we definitely have to look at and learn from," says Ramleth.

In fact, Ramleth's search for answers in the consumer tech arena is not unusual, says James Staten, principal analyst with Forrester Research. Today's IT demands require new thinking. "CIOs are being asked to continue to reduce the overall spend on IT," he observes. "They're also being asked to spend more time building new applications and driving flexibility and doing things that transform business." To do it all, something's got to give. "You can't manage IT the same way you've always managed it and empower new flexibility," Staten says. "You have to be able to walk away mentally from old processes and procedures."

Thus, CIOs are no longer satisfied with the "your mess for less" offering from an EDS or IBM. They're looking for inspiration from Google and other Internet-era titans. The consumer technology focus on simplification, standardization and on-demand applications made available via cloud computing holds some clues for how Bechtel and other corporate IT departments might rewire themselves. (Read "Finding a Way to the Cloud," Page 44 to learn what other IT and business leaders think.)

For most enterprise IT organizations, however, there's been

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Mobility Offers Productivity Gains, and Challenges

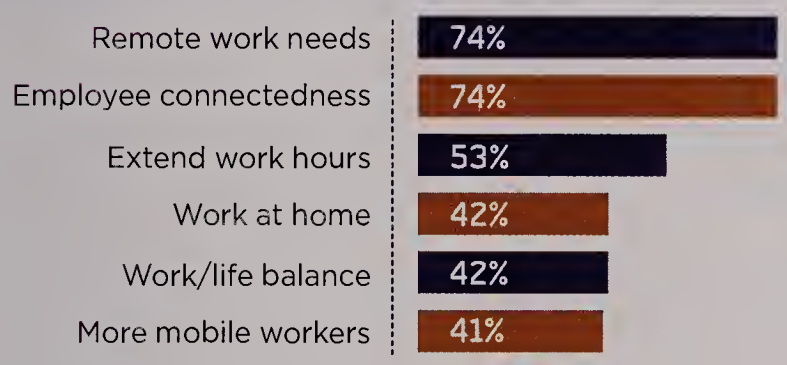
A new survey reveals CIOs' concerns about managing the mobile environment

Market Pulse

Mobile workers enjoy the flexibility of being able to work remotely on laptops, and business executives enjoy the resulting employee productivity gains and efficiencies. CIOs, on the other hand, must resolve and manage the resulting support challenges, costs and security risks inherent in enabling mobility for their businesses.

And the situation will only become more complex. According to a new study by IDG Research Services, 61 percent of IT leaders say they fully expect the number of mobile workers in their organizations to grow over the next 12 months. Furthermore, working remotely is no longer the sole domain of senior executives and sales managers; mobile computing has expanded to include employees in nearly all departments.

Top drivers of laptop usage



Mobile Management Challenges

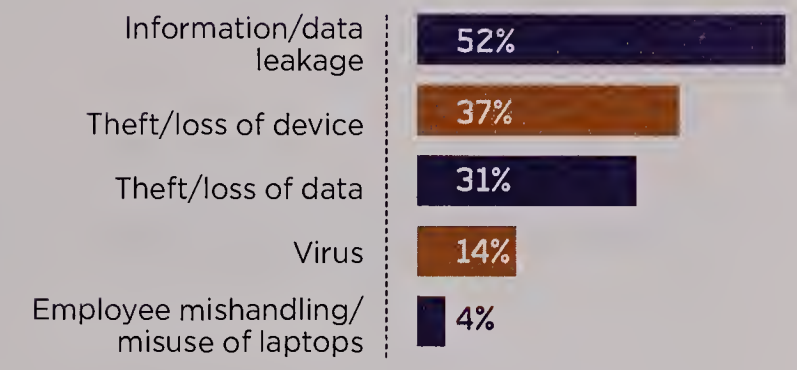
The rapidly changing mobile landscape is causing considerable concern for CIOs. Among the worries keeping them awake at night is the potential fallout from a security breach resulting from the loss or theft of an employee's laptop. Unfortunately, 64 percent of IT leaders tell IDG Research that they are only somewhat, not very or not at all confident that their technologies and policies could prevent a major security failure.

This lack of confidence speaks to the mobile management challenges facing today's CIOs. Indeed, more than half of them say that laptops are the most expensive devices to manage and support, and that controlling costs is among their top five concerns.

Ultimately, productivity suffers when mobile management challenges are not addressed. For example, 71

Source for chart data: IDG Research Services, August 2008

What are we preventing?

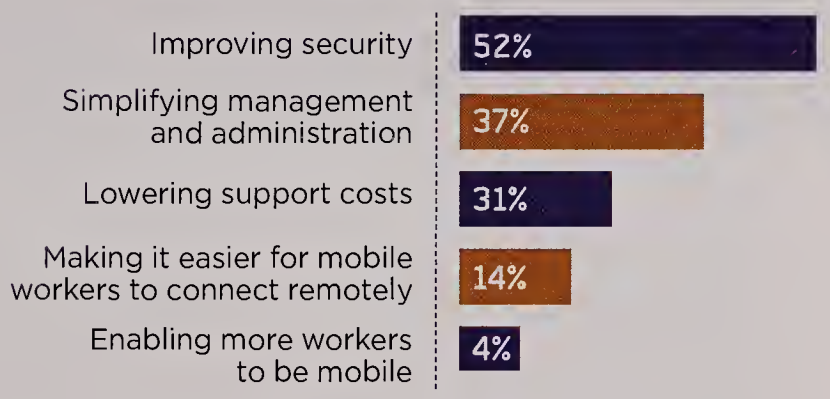


percent of CIOs say they have to deny mobile workers' requests for add-on software due to management and security concerns. The volume of requests, coupled with restrictive policies, slows everybody down.

Meanwhile, connectivity remains a constant concern. Fifty-two percent of CIOs list Wi-Fi connection fees among the greatest expenses related to managing mobility.

CIOs put improving security, simplifying administration and lowering support costs at the top of their lists for improving the management of mobile devices. But these IT leaders tell IDG Research they need help managing their mobile computing environments, with 22 percent reporting that they are struggling to find technology and solutions to do it.

Laptop management priorities



To read the full results of this research study and discover strategies to manage and optimize your mobile environment, download the white paper "Mobility is Growing: Survey Shows why CIOs are Concerned" at www.cio.com/whitepapers/mobility

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more talk than action to date, observes Rubin. And whether or not corporate IT catches up to its consumer-tech counterparts is, in large part, dependent on IT leadership. "Historically, the CIO was the gatekeeper. But as IT has moved from "mainframe to client server to all over the place," says Rubin, "you have to start to open the gates."

"In the past we wrote applications for an internal, secure environment—inside the firewall," notes Ramleth. "Now we want to create an environment for applications meant for the Internet, rather than the intranet."

Ramleth, who thinks there's a little geek in everyone dying to defy the status quo, has little hesitancy about creating a next-generation IT delivery model. "I'm passionate about it because I truly believe that we as a company can do business very differently in the future by changing the way we do our IT service offerings," Ramleth says. There's an old adage, popular in the recovery community: If you always do what you always did, you'll always get what you always got. Ramleth repeats it like a mantra. "There's too much change in the world on all fronts to accept that things should always be the same."

Bechtel's New Benchmarks

The company's goal is to bring IT costs in line with today's online powerhouses

In today's business environment, says Bechtel CIO Geir Ramleth, IT needs to benchmark itself against a new set of peers: successful technology companies that built their IT systems in the Internet era. Doing so is a painful exercise for the ego. "Corporate IT is trying to break the sound barrier, and the Googles and Amazons are supersonic. They're hypersonic," says Howard Rubin, president and CEO of Rubin Worldwide and a Gartner senior advisor. But the exercise can yield big returns.

Ramleth researched 18 companies and developed benchmarks against many of them. Among them were: YouTube, Google, Amazon and Salesforce.com.

COMPANY	TECHNOLOGY	BENCHMARK *		WHAT BECHTEL LEARNED
YouTube	Wide-Area Network	YouTube paid $10-15/megabit	Bechtel paid $500/ megabit	It was more than volume discounts from telecom vendors that got YouTube its lower costs. YouTube locates its data centers in places where there's already a lot of bandwidth, so they don't have to pay as much for infrastructure.
Google	Servers	Google employed one systems administrator for about 20,000 servers.	Bechtel employed one systems administrator per 100 servers.	Bechtel was building whatever the business wanted, whenever it wanted, wherever it wanted. Google standardized its server infrastructure.
Amazon	Virtualization	Amazon sold storage to external customers for 15 cents/GB/month (estimated).	Bechtel's internal storage costs were $3.75/GB/month.	Amazon could sell storage cheaply, Ramleth believes, because its servers were more highly utilized.
Salesforce.com	Applications	Salesforce.com provided one version of one application for 1 million users. Upgraded four times/year with minimal downtime or training.	Bechtel ran 230 applications, up to five versions of each—nearly 800 different application versions altogether. Upgrades and training were constant. No version management.	"We're so far apart from Salesforce, it's scary," says Ramleth. His team is converting Bechtel's 50 most heavily used apps into single-instance software-as-a-service apps run from a Google-like portal.

*Benchmarked costs for Google and YouTube are based on research and estimates by Bechtel in 2006 and may not reflect current numbers.

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Better Benchmarks

Ramleth and his team dedicated nearly a year, beginning in the spring of 2006, to studying 18 companies, including a few nonconsumer companies, which had built their IT infrastructure and applications in the post-Internet era. "We found some tremendous discrepancies between our internal metrics and the metrics these guys were dealing with," Ramleth says.

YouTube, serving up videos to the masses, was paying $10 to $15 per megabit for networking. Bechtel was paying at least 50 times that. One Google system administrator was running approximately 20,000 servers; Bechtel's could manage just 100, which was found to be common in enterprise environments.

BECHTEL'S GOAL IS TO CREATE A GOOGLE-LIKE EXPERIENCE FOR ENTERPRISE APPLICATION USERS.

Amazon offered storage to its individual and corporate customers at 15 cents per gig per month. Bechtel's shelled out nearly 40 times that amount. Salesforce.com upgraded software for its one million users four times a year with minimum downtime and no training. Bechtel couldn't even get all its users on the same version of its software. (For more on Bechtel's benchmarking results, see "Bechtel's New Benchmarks," Page 40).

"If they can do it, why can't we do it?" Ramleth wondered.

The answers provided a road map for PSN. YouTube has lower networking costs because it maintains locations near high-bandwidth areas. Google doesn't need hundreds of employees to run its servers because they're standardized to the hilt. Amazon keeps a lid on storage expenses by making sure its servers are highly utilized. And Salesforce.com offers easy upgrades because it runs one application in one location for a million users.

Bechtel, Ramleth thought, could do some of that. He and his team came up with a plan to incorporate the best practices of those technology powerhouses by building new data centers and networks to support multitenant applications within Bechtel. By Ramleth's calculation, the majority of the project could be paid for by reallocating funds set aside in the regular IT budget for refresh and maintenance work. (Bechtel will not reveal how much the PSN transformation will cost.)

Is Your Software SaaS-Ready?

CIO.com writer Thomas Wailgum reports on **SAAS'S IMPACT ON ENTERPRISE ERP** at **www.cio.com/article/443914**.

CIO.com

And Ramleth, a native of a Norway who enjoys skiing, motor racing and once held an official powerboat speed world record, wasted no time getting started. "I like speed," he says in a moment of sheer understatement.

Between 2002 and 2006, Bechtel's infrastructure group had consolidated 14 data centers into seven (completely modernizing six of them). Ramleth launched the PSN initiative almost immediately afterward. In 2007, Bechtel built three new standardized data centers in entirely different locations—one in the United States, one in Europe and one in Asia—and began decommissioning the seven that had just been revamped. The company took 30,000 square feet of data-center space down to a couple thousand and built out a totally new network between the three new data centers. "In the past we had brought the network to the data," says Ramleth. "But with the PSN, we wanted to bring the data to the network. We moved closer to the traffic aggregation points."

The IT group also consolidated additional servers, using virtualization to get to 70 percent utilization. (Virtualizing the apps has been a challenge, however. "As we started doing more virtualization, we had to be more sensitive to how applications are designed and developed as well as how we operate them," Ramleth notes. More on that later.)

The transformation was tough for the infrastructure team, admits Ramleth. He highlighted the difference between the two infrastructure overhauls for his team and his peers. The first was done to reduce operation costs, pure and simple. The PSN transformation, says Ramleth, "is meant to change the way we can serve business on a global basis."

Today, Bechtel has migrated approximately 50 percent to 60 percent of its users to the new environment. "Our total costs are the same, but with a heck of a lot more capacity," Ramleth says. Ten times more, to be exact.

The Service Provider Mind-Set

The infrastructure work, it turns out, was the easy part.

Once the new backbone was in place, Ramleth planned to certify Bechtel's most heavily used applications for the new environment. The ones that made the cut would be offered in a software-as-a-service fashion. Those that didn't would be left to die off as employees and partners using them finished their projects.

Only one problem: The external multitenant application model, which assumes centralized management of applications and data for all users, isn't an obvious fit for Bechtel or other large enterprises.

"The information that we have in our systems is not always ours. We might deal with a partner that has proprietary technology information that they don't want to leave our prem-

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ises," says Ramleth. "If you have to go to a SaaS provider, you might not any longer know exactly where information is."

It's also tough for a big, often Byzantine business like Bechtel to alter its processes to align with an external SaaS offering. "The change would just be too big," says Ramleth. "Because of the highly distributed way we operate, it would be hard for us initially to integrate a third-party SaaS offering with our work processes and embedded applications." In addition, he says, there are industry- or enterprise-specific applications, like Bechtel's proprietary suite of procurement applications, that aren't available from a reliable SaaS vendor today.

The solution became for Bechtel IT to become its own SaaS provider to Bechtel's project teams. It's a position Ramleth may be predisposed to. In 1995, he started and ran an ISP called Genuity, funded by Bechtel, which provided high-speed Internet solutions for mid-to-large-sized organizations (Genuity was acquired by GTE in 1997). "Until we have [vendors] with applications and service models that work in our industry, we can learn from other guys [in the SaaS industry] about how to do it ourselves." (Ramleth is one of 12 CIOs inducted this month into the CIO Hall of Fame. Read more about him and other newly selected Hall of Famers in "Hall of Fame," Page 51.)

By the end of next year, Ramleth expects to convert and certify 50 of Bechtel's most heavily used applications for operation in the new environment and offer them to users via Internet-based portal technology that includes Microsoft SharePoint.

Google-Like Apps

The IT organization studied software usage patterns and found that for any given application, 80 percent of users weren't doing heavy transactions. They were mainly trying to get some information (such as the status of a project) or perform a minimal operation (such

Finding a Way to the Cloud

Bechtel has bet its IT future on cloud—or on-demand—computing. But for many IT organizations, the concept remains pie-in-the-sky, according to our survey.

CIO RESEARCH

Not Yet Business-Critical

Less than half of IT organizations currently use on-demand resources for enterprise applications or infrastructure.

	Currently using or implementing	Plan to use in 1 to 5 years	On the radar/ researching	No plans
Collaboration tools	50%	15%	18%	18%
Enterprise applications (e.g. CRM, ERP, BI)	35%	12%	19%	34%
Application platforms/ development software	34%	9%	27%	31%
Utilities (e.g. antivirus spam filters, desktop management)	33%	14%	21%	32%
Servers	32%	11%	18%	39%
Storage	31%	16%	22%	30%
Networks	27%	12%	17%	45%
Personal productivity software	23%	13%	22%	43%

Big Changes for IT Someday

There's potential for the cloud to transform IT. But technology and security must mature, first.

Cloud Computing...	Agree	Disagree	Neither/Not Sure
Will cause a radical shift in IT	58%	24%	18%
Will take years to mature	54%	30%	16%
Current offerings are not appropriate for my business	36%	44%	20%
Vendors have not adequately addressed security concerns	60%	19%	20%

CIO.com visitors were invited to take the Cloud Computing Survey from Aug. 18–31, 2008. Survey findings are based on 173 responses from IT and business professionals. The margin of error is +/- 7.5%. Numbers may not equal 100% due to rounding.

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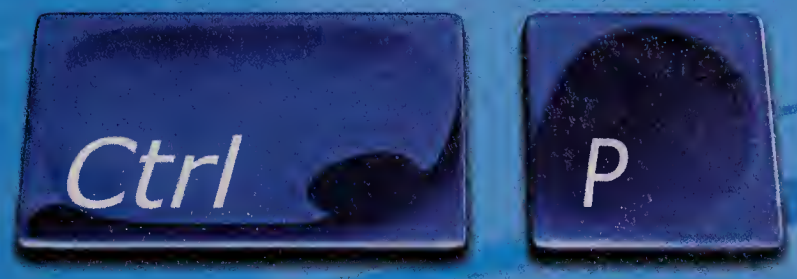

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as make a purchase). Ramleth's team realized this majority of users could benefit from having access to smaller pieces of big applications via the portal. "You can make a few screens available to a user who otherwise would have had a myriad of applications to go to," says Ramleth. "It wasn't rocket science, but we finally got that."

The goal is to create a Google-like experience for enterprise application users. Log in to the portal, pick a task and get it done in a few simple steps rather than logging in to an assortment of applications. "The portal is really where we'll get the benefits of the consumerization approach," says Ramleth. He expects that new versions of applications and pieces of applications delivered via the portal will lead to increased productivity and reduced training for users.

Some users will still need the full version of certain applications—such as computer-aided design software—and IT will continue to support them. "Those designers aren't necessarily nomadic users," says Ramleth. "We'll keep the larger-scale deployment models for those stationary heavy users."

So far, IT has converted about a dozen applications to the new environment and made parts of many more available via the portal. Microsoft Exchange, which used to run on more than 100 server environments around the world, is being consolidated via the PSN. InfoWorks, Bechtel's workflow and document management system—which used to be deployed in a distributed fashion project-by-project—has been rewritten to operate on a centralized, multitenant platform.

The development team has had to keep in mind the requirements of the new, highly virtualized back-end when rolling out new Internet-based versions of Bechtel applications. "You have to use technologies that are already certified for use in the virtual environment. You have to tune your databases differently. You have to write and architect applications that can work in a multiprocessor environment and [according to a] dynamic utilization model."

In some cases, IT is rewriting the old applications. In others, they're transitioning the legacy systems to the Internet using the virtual application server from Citrix.

Ramleth knows that some applications will be harder to convert to the new environment than others. While there are no "show-stoppers," he says that figuring out how to rework Bechtel's in-house procurement application is going to be particularly difficult. "We can't lean on the vendor community for help," he says. What's more, "it's as big an application as a full-size ERP implementation. But we believe that it's a big differentiator for us in the marketplace."

Ramleth's team is migrating employees and partners to the PSN portal as they are assigned to new projects. Ten thousand users globally are using services within the PSN today, and

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Bill Courtright,
Executive Director/Parallel Data Lab/Carnegie Mellon

Greg Ganger,
Director/Parallel Data Lab/Carnegie Mellon
Professor of Electrical and Computer Engineering/Carnegie Mellon

Ramleth has the complete deployment wrapping up by the end of 2009. It's not an easy transformation for any company. "If you look at Google or Amazon, they were able to build their infrastructure with no legacy," says Forrester's Staten. "Most organizations just find it too hard to operate in the flat Google environment because they have to completely rewrite all of their applications," the way Bechtel is doing. "But what they need to do now is look at their IT portfolio and start segmenting it into things that have to still be done the old way, and things that can be transformed."

> **"YOU CAN'T MANAGE I.T. THE SAME WAY YOU'VE ALWAYS MANAGED IT AND EMPOWER NEW FLEXIBILITY."**
>
> –JAMES STATEN, PRINCIPAL ANALYST, FORRESTER RESEARCH

"To be totally honest," Ramleth says about the application transformation, "this is where we still have a lot more work to do."

Dealing With Disruption

It's been a period of disruptive change for IT. "Without change, life would be boring," Ramleth says, but he realizes that many people in his organization hold a dissenting view.

The first issue that surfaced was security. "When you start saying, 'We should think more like an external provider,' the first thing people say is, 'Let's be careful with what we're doing in security.'"

Ramleth made a deal with his security team—a hand-shake pact that before anyone spent any significant amount of money on PSN, there would be a clear view of how security might work. So while other teams researched the new infrastructure and applications environment, security did its own studies. By March 2007, when PSN work began in earnest, the security team had embraced a new way of thinking. Bechtel began working with Jupiter Networks on a policy-based security model for the PSN. It's not perfect yet, but it's progressing. "It's a big change from having stuff inside or outside a firewall to this model we call any-to-any, secure-when-needed," says Ramleth.

"What has been harder is getting our IT people to accept these larger changes," he continues. "IT people are not the risk takers of the world." And for many at Bechtel, the PSN represents

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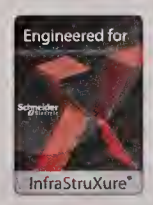

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big professional and personal risk. Specialized skills they spent years perfecting are seemingly going by the wayside in a more commoditized, cloud-based IT world (although the new technology, as Ramleth sees it, brings with it additional opportunities as well).

Ramleth identifies three ways employees respond to change. "You have some people that just take you on blind faith and say, 'This makes sense, let's figure out how to do this,'" he says. Next, "there are some early followers who say, 'I would like to be there, but tell me that I am not going to get hurt.' They don't need too much convincing." In the third group "are the people who become part of the problem rather than part of the solution."

> BECHTEL STUDIED COMPANIES THAT HAD BUILT THEIR I.T. INFRASTRUCTURE IN THE POST-INTERNET ERA. **"WE FOUND TREMENDOUS DISCREPANCIES BETWEEN OUR METRICS AND THE METRICS THESE GUYS WERE DEALING WITH."**
>
> –GEIR RAMLETH

The key to winning over the staff is to look for individuals in the latter group whom you can convert from pointing out everything that's wrong with the new plan to helping you figure out what has to change to make it right. Notes Ramleth: "I often say to people, 'I don't know of anybody that embraced change that ever got hurt by it. Most people that embrace change benefit from it.'"

Experts say such a transformation can benefit the larger IT group, even if it's unsettling for individuals. "The enterprise can actually start to do things quite differently," says Rubin. "[It can] take all that time and money tied up in technical specialization and leverage that massive amount of new computing power to create business differentiation. It frees up money and it frees up focus."

Everything as a Service

If Bechtel is able to get its big applications up and running in the new environment by the end of next year, that will be a success. But it's just a baby step, says Ramleth.

"If you say the ideal world is when everything is done as a service—computing, storage, software, X-as-a-service—and you look at where enterprises are today, we have a long road to go," says Ramleth.

He imagines a 10-step process. Steps one and two were to build the foundation—three new highly standardized and virtualized data centers. The next few will be to transition the old applications into the new environment. Then comes the hardest part: getting new business value from the PSN. Or as Ramleth puts it, "what it is that you can do now that you never did before."

One of those new things will be to offer partners and customers lifecycle information management. Today, there's no comprehensive capture of information on Bechtel's massive, years-long projects. But if the PSN becomes a part of day-to-day business, says Ramleth, "we can really start doing cross-company integration."

For example, Bechtel recently built a polyethylene plant in China. Once the PSN is fully deployed and integrated into Bechtel's business operations (by 2011 or 2012), Bechtel could help the plant owner implement its IT infrastructure and applications so that all of the information that was gathered while Bechtel was on the job is automatically integrated into the customer's IT systems. If there's a problem with, say, a valve, someone would be able to query the plant's SAP maintenance software and find out who the manufacturer is, what the specs are and how to fix the problem. Better yet, as more viable "X-as-a-service" offerings become available from third-party providers, Bechtel will be in a better position to plug and play. "Could we someday buy storage from Amazon, for example?" asks Ramleth. It's possible, he says. With the in-house transformation behind Bechtel, "making that leap will be easier."

"We see what we're doing with the PSN—creating our own internal proprietary cloud—as an enabler and precursor to [embracing] third-party SaaS offerings in the future," he says. "We'll have already broken down our old operating model and reduced internal complexity."

Meanwhile, Ramleth no longer gets blank stares when he talks to his executive peers about incorporating the best practices of YouTube, Google, Amazon and Salesforce.com. Not only that, he reports, "I'm getting a heck of a lot more interest from CIOs asking how they can do this. Maybe they're starting to come into some of the same issues we were, or maybe I'm just articulating it better."

Ramleth is convinced that IT leaders who wait to pursue similar strategies will be at a disadvantage down the road, as they continue to build more complexity and resource demands into their current environments instead of systematically trying to reduce that complexity and increase efficiency. "You have to start opening up a little to this way of thinking so you can start to transition now, rather than making it an expensive forklift operation down the road."

If the day comes when all computing moves to the cloud, at least Bechtel, Ramleth insists, won't have to start from scratch. CIO

Stephanie Overby is a freelance writer based in Boston. To learn more about Bechtel's infrastructure overhaul or to comment on this article, go to *www.cio.com/article/453214*.

HOW OUTSOURCING *has changed*

A CIO dialogue on outsourcing

CIO Publisher Emeritus Gary Beach recently sat down to discuss the changing face of outsourcing with four senior IT executives:

Bruce Metz, CIO, Thomas Jefferson University;

Don Sturdivant, senior vice president and CTO, Square 1 Bank;

Tim Fleming, vice president for IT, Ingersoll-Rand;

Rocco Musumeche, senior vice president for IT Outsourcing Business Development, CompuCom.

Following is an excerpt from their discussion. The full webcast is available at www.cio.com/webcasts/sponsored/compucom.

Gary Beach: What are some of your IT priorities in the coming 12 months?

Bruce Metz: I think getting value is the number one issue. Since Jefferson University is making a very significant investment in IT, we're really making sure that we get value out of that investment.

Don Sturdivant: Security has to be part of that. We're in a regulated industry, and you can't do anything without security. We've been able to do a lot by leveraging outsourcing in appropriate relationships with vendors. I don't want to grow my organization any faster or larger than I need to, so I have to put my investments in different areas, and so I view outsourcing as a force multiplier.

Beach: Rocco, do you get the same kind of sense when you're talking to customers?

Rocco Musumeche: Cost is key, but also, they want to make sure that their environment is secure. They are also looking for value creation: what can we do above and beyond just the cost? How can you have access to additional resources and capability when you outsource? One of the things that we're beginning to see is that you have to follow ISO 20000 and be familiar with the ITIL process. Whenever you do that, you'll see a cost reduction and get a value proposition that can drive your business forward.

Beach: How does the talent and skills aspect play, in terms of working with an outsourcer?

Metz: That's an integral part because we're basically a service organization. We get to do some fascinating stuff in terms of helping the organization accomplish strategic goals and use the latest and greatest technological advances. But we don't get to do that unless the services that we provide are rock solid and meet most of our customers' expectations. Fundamentally that comes back to the quality and skill level of the people we have in the IT organization. You typically need to go outside the organization to find some skill sets. The level of customer service that outsourcing vendors provide has gone up considerably in my experience. One of the really great feelings I get when I walk into a room where there's a project team that has folks from our organization and from outside is you can't tell who's who. They blend together and it works really well. And a large part of that, I think, is due to the level of maturity that the outsourcing organizations have reached.

Beach: When reviewing an outsourcing vendor, which factors are most important?

Tim Fleming: You focus on the relation-

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IT is a service organization that delivers a service —it has to function from A to Z

– Bruce Metz, Thomas Jefferson University

ship. It's very difficult to quantify that up front in a bidding process, but you've got to spend time and understand who is going to be working on your account. Comprehensiveness of service is absolutely a differentiator, [as is] name recognition, when you're going to your president or CEO and saying 'I'm taking a piece of our business and handing it away, this is why you can feel comfortable with me making these recommendations.'

Sturdivant: We're looking at the quality of the service. New companies or early-stage companies—they may not have the market recognition, but you can see what's happening in the marketplace. And even if they aren't the leader, they could succeed in areas that haven't been thought of before.

Beach: Rocco, what are you seeing in terms of what is important to customers?

Musumeche: It's got to be a win-win for our customer and for us. That's key; if it's not a win for both parties, there's no use in getting involved in the engagement.

From left, Bruce Metz, CIO, Thomas Jefferson University; Don Sturdivant, SVP/CTO, Square 1 Bank; Tim Fleming, VP/IT, Ingersoll Rand; and Rocco Musumeche, SVP for IT Outsourcing Business Development, CompuCom.

Beach: For a CIO looking to start a relationship with an outsourcing vendor, what one piece of advice would you give them?

Metz: You have to think long and hard about that part of your IT business where you want to entertain outsourcing as a solution. And that starts with going back to thinking through what your core competencies are, and what is the value gained by these other areas that you define outside of your core competency? But then treat each one as seriously as any other because it's still an essential part of your business. [Go] back to the idea that IT is a service organization that delivers a service—it has to function from A to Z.

Beach: Should CIOs treat the outsourcing personnel as an extension of their own staff?

Metz: Absolutely. And in fact, where you're talking about a cost-plus, this is a trend where outsourcing is going to increase in the larger part of our IT business. I think we're creating a new IT role of needing someone to manage all of our outsourced arrangements. And I've seen outsourcers who will do that for you.

Beach: Don, what piece of advice would you give?

Sturdivant: Ask yourself: how does the organization relate to and understand my business? It's as much a challenge to get my own IT organization to understand the uniqueness of the business because they speak and think in IT terms, not necessarily in business terms. So if a vendor is specific to financial services, they're going to have, in theory, enough organizational experience to be able to add some value.

Beach: And Tim, what would you say?

Fleming: This is not about procurement practices and trying to drive down to the lowest cost. They have to understand your business, and I have to understand their business. When I come to the table, we're working on a problem—[it's] not me telling the vendor to go and fix the problem. If we're not working on it together and finding out how to solve it, we're probably not where we want to be yet.

Learn more about the changing face of outsourcing. The conversation continues at www.cio.com/webcasts/sponsored/compucom.

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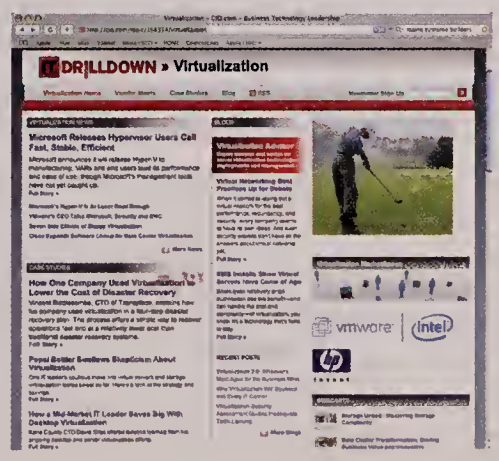

Dave Barnes

Delivering for the Business

SVP and CIO, UPS

Started UPS career as a part-time package loader in 1977. Held key positions during its global expansion efforts in the late 1980s and early 1990s, combining his knowledge of finance, the industry, daily business operations and technology. • Lead business manager on development of International Shipments Processing System, a *Computerworld* Smithsonian award-winning software application developed internally. • Special projects manager during start-up phase of UPS Airlines in 1986, one of the fastest-growing airlines in FAA history. • In 2001 took on Information Services Customer Technology Portfolio, managing virtually all UPS technology initiatives that directly touched the customer, including UPS.com. • Led customer technology, customer development, and operations and transportation development as VP of application portfolios. • Rolled out route-planning software that cut 29 million miles off delivery routes last year, saving more than 3 million gallons of fuel and reducing CO_2 emissions by more than 31,000 metric tons. • With team, developed UPS's innovative integrated delivery network, which uses technology to combine its home, ground and overnight delivery networks into one seamless system.

Barnes's long tenure with the company and his depth of knowledge about IT and the fundamentals of the industry make him a valued contributor to UPS's strategy and execution, says CFO Kurt Kuehn. "He is able to blend tremendous knowledge of the business with his understanding of the technological infrastructure and capabilities," says Kuehn.

June Drewry

Mentor Extraordinaire

EVP, Corporate Process Executive (and former CIO)
The Chubb Insurance Group of Companies

Served as Global CIO of Chubb Insurance Group from August 2005 until March 2008. Specifically brought in to fill CIO role and to develop an internal successor. Began end-to-end process redesign project for two of Chubb's business units after leaving IT. • Serves as a director of the Society for Information Management, with past service as a chapter president, a member-at-large on the SIM International Board of Directors and president of SIM International. Received "SIM One" award in 2005 for outstanding leadership and commitment to the society and the IT profession • Board member for Acord, a data standards body for the insurance industry. • Held CIO positions at Aetna, Freddie Mac and the Aon Group. Developed several direct reports into successful CIOs. • As president of Systematized Benefits Administrators, completed a turnaround program for the Aetna Life Insurance and Annuity Company subsidiary. • While focused on information technology, Drewry has had other strategic responsibilities such as corporate planning and knowledge management.

Drewry joined Chubb in 2005 as a transitional IT leader. One of her missions was to groom an internal successor, says John Degnan, vice chairman and COO of Chubb. But she also oversaw the completion of Chubb's infrastructure outsourcing project during a critical juncture. "In a very short time—three years—she had a very large impact on the IT structure and the service it provided to the business units," says Degnan. Managing change is one of Drewry's special talents. "She has been a master at going into very large and complex organizations and turning them around," says Darwin John, former CIO of the Church of Jesus Christ of the Latter-day Saints and a past president of SIM, where he met Drewry almost 20 years ago.

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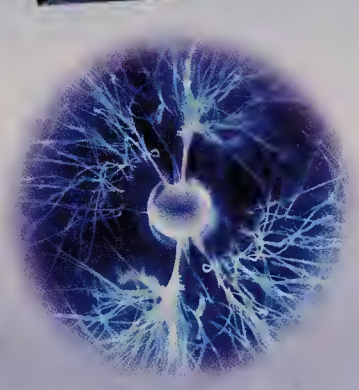

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Bruce Goodman

Connecting Customers

SVP and Chief Service and Information Officer, Humana

Oversees integrated technology and operations management teams responsible for transforming Humana's service model. Co-led cultural transformation initiative that resulted in an outstanding first-year improvement in engagement scores. Paired engagement program with a broad service improvement initiative that brings customer voice into decision making. Initiated joint venture in 2001 between Humana and rival Blue Cross Blue Shield of Florida to form Availity, an Internet-based, multipayer physicians portal that streamlined administrative workflow and improved communication between healthcare stakeholders. Launched SmartSummary, nation's first in-depth, monthly benefits summary to help health plan members track and save money on prescriptions, and manage claims and benefits coverage. Oversaw development of technical solutions to aid in collecting massive quantities of data and producing over 30 million personalized statements yearly. • President of Business Systems at Prudential from 1993 to 1995. CEO of Prudential Service Co. from 1995 to 1998. Led significant infrastructure improvement effort to leverage distributed computing and Internet usage, including e-mail and IP rollout to over 35,000 workstations and a WAN redesign. Achieved annual savings of $126 million in enterprise procurement. • In 1982 at MetLife, led efforts to move data processing closer to customers. Pioneered installing and linking of minicomputers in 1,500 branch offices to corporate systems, decreasing the time spent producing insurance quotes. Advanced point-of-sale automation coupled with laptops for field sales.

Goodman's ability to align IT and business allows him to drive organizational change. "By knowing where the leverage points are to improve top- and bottom-line performance, and by developing strategic partnerships, Bruce was able to help us optimize our technology investments and accelerate our business transformation," says Michael McCallister, Humana president and CEO.

Patricia Lawicki

Power Player

SVP and CIO, Pacific Gas & Electric

Named PG&E SVP and CIO in 2005. Brought in as part of a mostly new executive team to begin a major business transformation. Centralized and consolidated disparate IT groups into a single-solution delivery center focused on implementing programs to support multiyear, enterprisewide business transformation. Successfully delivered over $600 million in new, large-scale enterprise ERP solutions in a three-year span. Standardized platforms and consolidated hundreds of legacy applications leading to a multimillion-dollar reduction in support costs in application support, telecommunications, infrastructure and networking. Rolled out the SmartMeter program, the largest deployment of advanced metering technology in the U.S., to provide better, faster and more cost-effective service to its customers. PG&E can remotely read meters and facilitate rate options to encourage energy conservation and help customers save money. • Named one of the top 100 CIOs by *Information Week* in 2007. • Held dual role as NiSource's CIO and VP of enterprise integration and strategy. Involved with NiSource's consolidation and reengineering of enterprise operating functions.

Lawicki's leadership enabled IT to play a critical role in PG&E's business transformation. "Whether it's improving the efficiency of our workforce or delivering better service to our customers, IT is oftentimes pivotal in getting us there," says Peter Darbee, president and CEO of PG&E. Lawicki understands the needs of customers and the business, and uses that knowledge to determine technology needs "from a strategic basis, not just from a tactical, just-get-it-done-every-day basis," says Chris Johns, SVP and CFO of PG&E.

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Patricia Morrison

Combine and Conquer

Former EVP and CIO, Motorola

Extensive MA&D experience in various industries. • Built consistent track record creating value from IT investments. • Oversaw reduction of more than $50 million in annualized IT infrastructure spend at Motorola with no direct impact to the most strategic programs. Aligned IT strategic investments to expand go-to-market channels worldwide. Drove adoption of SOA, middleware, Web 2.0 capabilities, SaaS and strong architecture governance to meet business needs. Implemented incident and change-management processes which resulted in 30 percent improvement in cycle time and $25 million reduction in cost of poor quality. • Won 2008 CIO 100 Award. • Office Depot EVP and CIO from 2002–2005. Managed global information systems, including successful e-commerce platform. During tenure, integrated Guilbert acquisition and put in place best-in-class forecasting, replenishment, and merchandise and store planning applications. • CIO for Quaker Oats in 2000. Developed information systems plan and technology architecture to support key business initiatives. • After PepsiCo's acquisition of Quaker, led IT efforts merging Tropicana and Gatorade businesses. • Held CIO posts in General Electric's electrical distribution and controls division, and GE industrial systems. • Held systems management and IT leadership positions at Procter & Gamble. Created IT career path in marketing analysis that is still in place today.

Former Motorola Chairman and CEO Ed Zander once witnessed Morrison's poise and substance at Wrigley Field, home of the Chicago Cubs. "I was with her when she sung the national anthem in front of 35,000 people. Without music. In an opera voice. Sang right out on the field," he says of Morrison, a trained opera singer who auditioned for the gig. "That alone tells me about her character." Of Motorola's senior leadership, he says Morrison "was one of those lynchpin people. A lot of people just think about their department. But Patty is about the company and her people."

Keith Morrow

Retail Innovator

SVP and CIO, Blockbuster

Reconfigured IT from back-office team to strategic partner for Blockbuster after becoming CIO in 2007. Reduced IT spending by over 25 percent in nine months while delivering critical transformation projects such as digital movie kiosk. Integrated Movielink.com into Blockbuster.com. Opened Indian application center of excellence. • Named 7-Eleven CIO and SVP of Information Systems in 2001. Turned high-cost IS function into business-aligned, strategic IT capability. Implemented mobility store platform so merchandising and inventory operations happen on sales floor, not back office. Created state-of-the-art merchandising and ordering terminal for stores. With NCR, developed Vcom Money Center Kiosk to meet unbanked and underbanked customer needs. Helped drive record same-store sales growth and profit increases. • Created Internet lending business for consumer mortgages and mortgage broker relationships as SVP of e-commerce for Associates First Capital (now CitiGroup). • During 20-year ADP career, started two new divisions, implemented Platinum Service Offering and won "Quality Award" three times. • Serves on board of State of Texas Department of Information Resources. Consolidated redundant data centers into shared services model.

"Keith helped me learn the power of technology, especially as a retail enabler," says Blockbuster chairman and CEO Jim Keyes. By harnessing IT, Blockbuster pulls millions of pieces of data together into easy-to-use, intuitive tools that allow more-effective decision making at point of sale. "We are not taking the people out of the decision-making process through automation, but instead are using technology to facilitate fact-based decisions on a real-time basis."

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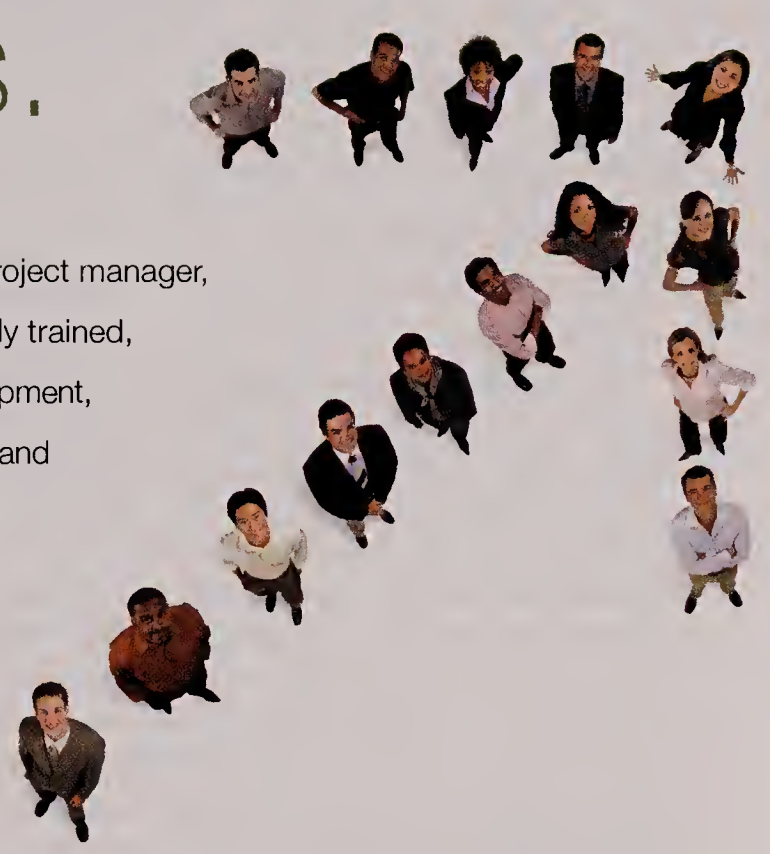

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1 Source: Insight and Trends: Current Program and Project Management Practices. 2007 survey by PricewaterhouseCoopers, p. 9

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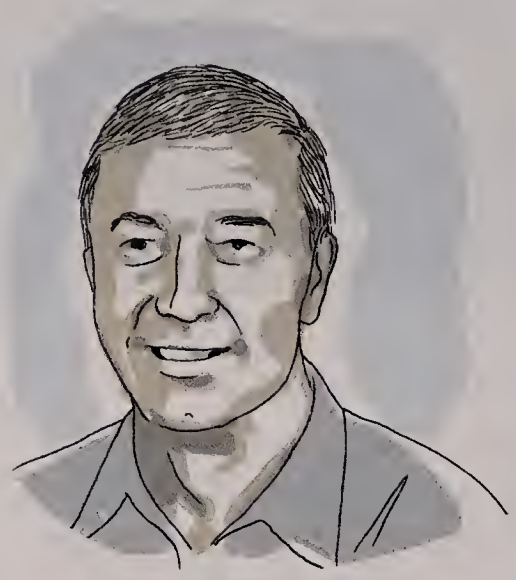
John Puckett

Tech Visionary

CIO of Central Research and Development and IT CTO, DuPont

Credited for pioneering open systems and adoption of TCP/IP. • At DuPont, introduced new and emerging technologies to improve security of intellectual property and new malware 3.0 attack vectors. Provides vision, guidance on standards, strategy, design and implementation of complex technology initiatives. Board member of DuPont Photonics. • Corporate officer, vice president and general manager of Wireless & Internet Technologies at Polaroid. • CIO of Toysmart.com and BBN. • Member of CEO's executive staff and strategic planning committee at BBN. Elected corporate officer by board of directors in 1995. • Ran GTE Internetworking Web hosting and services business after acquisition by BBN. • As executive manager of Global Business Development at Sun Microsystems, created and developed SunNetwork's business worldwide. • At Foxboro Co., initiated and managed global five-year strategic plan for Corporate Enterprise Network Computing; the entire corporate initiative reduced order cycle time by 75 percent; IT expenses worldwide cut by more than 40 percent; initiative won numerous awards. In 1982, developed and automated revolutionary standardized business process for new high-tech computer products that encompassed sales, systems, engineering operations, distribution facilities and manufacturing plants in 12 countries, resulting in financial savings. • Received *Computerworld*'s "Premier 100 IT Leader" award.



Puckett practices what he preaches in heading up the innovation process, says Phuong Tram, DuPont's CIO and VP of IT. "He scans the horizon of technology to see what we can use and what we can't," says Tram. DuPont CISO Larry Brock agrees. He recalls how, in a planing and strategy meeting, Puckett insisted that they needed to look out 20 to 50 years, then set strategies and plans for the next three to five years. "John always stretches the team to look beyond our current understanding," Brock says.

Geir Ramleth

Entrepreneurial Spirit

SVP and CIO, Bechtel

Responsible for Bechtel's IS&T's infrastructure technology operations, software applications development and deployment of technology solutions into business lines and projects. Instituted and led eSTOP initiative, achieving a 25 percent to 30 percent reduction in costs. • Chairman, CEO and founder of Digiplex, a communications and network facilities company. • In 1998 launched Geirheads, a private investment and advisory firm focused on fast-growing technology companies. • Founded Genuity, a Bechtel subsidiary, in 1995; as president and CEO, built it into industry leader in Internet service business. • Manager of commercial systems at Bechtel, responsible for consolidating all commercial systems activities. Built and managed automated Transaction Processing Center, reducing operating expenses by more than 50 percent. • Director of Oracle's applications consulting practice. • VP and CFO for Pagemart. • As manager of Controller Project Systems at Bechtel in 1989, headed team to test and select accounting systems for all company divisions. Led to one of the largest commercial software license agreements. • Member of the executive committee of the Roundtable Program, Center for Digital Strategy, Tuck School of Business at Dartmouth College.

Hans Brechbühl, the executive director of the Tuck School's Center for Digital Strategy, learned about Ramleth's strengths as an innovator while working with him at the Roundtable on Digital Strategies. "What Geir does really well is to question the status quo. He is not one of these people that just gets something into reasonable shape and rolls with it," Brechbühl says. Ramleth stands out both for his focus on innovation and his drive to get projects implemented. "Some people constantly question things, so much so that they never get things done," he says. "Geir gets the ideas moving and then actually implements them."

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Continual Service Improvement:

How CIOs quantify IT's value to business

Matthew Schvimmer,
SENIOR DIRECTOR OF PRODUCTS – ITSM & PPM, HP SOFTWARE
Schvimmer is the senior director of products in the HP Software division, where he is responsible for the strategy and delivery of the IT Service Management and Project Portfolio Management product families.

The IT Infrastructure Library (ITIL®) is a comprehensive, ever-evolving standard for IT to meet changing business demands and forms the basis for IT Service Management practices. The newly released ITIL V3 emphasizes aligning IT services with business objectives by taking an end-to-end service lifecycle approach, from strategy to operations and continual service improvement.

What is the "Service Lifecycle"—and is an IT service ever perfected?

As with a manufactured product lifecycle, you put a price and a cost on each IT service, track its performance and profitability and plan how you'll support it and ultimately retire it. As its name implies, continual service improvement (CSI) is a never-ending loop, because business needs are always changing. Why? Because CIOs are being pushed to optimize service quality yet minimize service costs for investment in other things.

What are some specific objectives CIOs achieve with CSI?

This is really where CIOs can quantify their contribution to the business. One such objective is reducing the financial impact of business services. For instance, a customer could identify top business services being delivered and prove in dollars versus downtime exactly how each service creates a competitive advantage. A second objective would be cutting costs by optimizing service supporting processes and resources based on what has happened in the production environment historically.

That sounds reasonable—what inhibits continual improvement?

One of the culprits is silos with little coordination of process or data. In such a situation, application, network and storage and delivery teams may not share objectives or key performance indicators (KPIs). A second is data overload. With large organizations experiencing as many as hundreds of thousands of service incidents, it is difficult to spot trends or see how a solution to one incident might solve problems elsewhere. That's why people embrace the ITIL V3 service lifecycle approach, which enables you to look at processes from end to end and break down the silos.

What indicators are typical in CSI or on an ITIL V3 executive dashboard?

At HP, we call our executive dashboard a "scorecard." It is built by first creating a catalog of services; defining a service-level-agreement, or SLA, for each service, and then defining key performance indicators against those SLAs. A common indicator is SLA performance over time—in other words, am I meeting the objectives to which the business has committed?

Another is the financial cost of downtime. CIOs must address how much this downtime affects the business as a cost and what the trend is. Customer satisfaction metrics are a typical indicator as well.

How does HP help customers do all that?

We have products out of the box that redefine KPIs and provide ways to measure them; tools underneath manage the service lifecycle. HP is unique in that we connect the whole service lifecycle, from financial planning and management—through utilization and forward-looking analytics, compliance, even service retirement—to help prioritize IT initiatives.

We also automate that process. A manually intensive process such as service analytics can't occur in real time, and frankly, the results from this would be questionable. It is far too easy to manipulate a spreadsheet. The alternative is rich, real-time analytics and automation that make those measures both credible and cost-effective, so a CIO can prove that "this is my contribution to the business."

FOR MORE INFORMATION:
Check out the white paper titled **"Give your business what it wants—implementing continual service improvement with ITILv3"** at **www.cio.com/whitepapers/hp-itil.**

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Andreas Resch

Passion for Business

Chairman of the Executive Board, Bayer Business Services and Group CIO, Bayer AG

Launched career at Berliner Stadtreinigung in 1983 working in organization and computer systems. • Responsible for organization and computer systems at Francotyp-Postalia, part of Röchling Group and supplier of mail processing, franking and enveloping machines. • In 1993 joined Herlitz AG, leading European supplier of stationery, as commercial manager for foreign companies. Appointed board member for logistics and IT. During his tenure, company received the 1999 user awards of the GartnerGroup and *Computerwoche* magazine for innovative IT solutions. • Managing Director and CIO of Fiege Deutchland, top logistics services provider. • Played major role in establishing CIO-Circle, a forum of 700 IT managers from German industries. • Named chairman of the Executive Board of Bayer Business Services and group CIO of Bayer AG in 2004. Introduced systematic realignment of company's activities, with aim of making its services more transparent and measurable for customers. Established integrated service as an advanced business model. Targeted performance as a business model for IT beyond budget orientation. Instituted professional management of innovation for IT. • Won seven consecutive "Jury IT" awards with Gartner and *Computerwoche* from 2000 to 2007. • Member of the Research Board and the Center for CIO Leadership (IBM).

Resch's "entrepreneurial grasp" of IT makes him a standout, says Klaus Kühn, member of the Board of Management and CFO of Bayer. "Andreas always had a vigilant eye on looming developments within IT and innovations in this field," he says. His focus on driving IT as a business including innovation and optimization of the IT value chain makes him valuable to Bayer. "Bayer is one of the biggest IT service providers and shared services organizations in Germany, and Resch helped establish the IT-delivery form for Bayer," says Walter Brenner, director of the Institute of Information Management at the University of St. Gallen, Switzerland.

Peter Walton

Fueling Innovation

CIO, Hess (Retired)

Moved from aerospace engineering to IT in 1985 as manager of information systems for GE Aerospace's Systems Integration group. • Standardized and operated data centers, security and mail system as director of enterprise operations for Lockheed Martin. • In 2000, named Director of Global Infrastructure and Operations at Hess. • Retired in 2004 but returned in 2005 at request of CEO John Hess to "take IS to the next level." Focused on business fusion, performance, people and innovation to fully engage Hess's IS workforce to outperform. Standardized company's infrastructure globally and reduced operating expenses. Brought total IS budget, including capital expenditures, to under 1 percent of total revenue. Provided competitive advantage to the business. Built sustaining leadership team at Hess, including successor. Recent internal employee satisfaction survey placed IS above the average organization in Hess, often by double-digit margins. • Hess won CIO 100 awards in 2006 and 2007 on his watch.

One of Walton's talents is his ability to turn an IT department around, as he did for Hess, says Carl Wilson, CIO of Marriott. "He goes into companies that are a mess and rebuilds the credibility of the IT departments within the company and sometimes even restaffs," he says. Walton's understanding of both leadership and the positioning of IT within an organization helps him create a competitive advantage for the business, Wilson adds.

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Robert Willett

Putting the Customer First

CEO, Best Buy International and CIO, Best Buy

Joined Best Buy as EVP of Operations in 2003. Responsible for supply chain, sourcing, dotcom, IT and enterprise transformation. • Developed strategy for key enablers from supply chain to back-office systems utilizing cutting edge technologies. • Within IT, created a structure of business information officers who are fully integrated into the business. • Extended retail-oriented architecture to accommodate interface with scheduling routing and dispatch that enables Geek Squad customers to enter the system and choose a convenient service time—a retail first. • Built service-oriented architecture to equip enterprise with multiple capabilities across 13 countries. • Provides capability to store GMs to monitor store manager's workbench, customer P&Ls and product solutions, which are updated every 7 seconds and provide full P&Ls by customer segment to 140,000 store employees. • With team, eliminated technology "hair ball" of 740 applications and technologies, plus over 65,000 interfaces—reduced by 70 percent. • Named special director to Best Buy Board. • Global managing partner of Accenture's retail practice. Oversaw SMART store program showing how technology drives innovation. • Board member of CIO Executive Council. • Received 2008 CIO 100 Award.

Willett "has enabled the company to move faster and pursue more far-reaching strategies than anyone else in our company's IT history," says Best Buy CEO Brad Anderson. Willett's efforts allow the company to think about and use IT in less-traditional ways. "Bob has the ability to challenge you in what you believe are the facts," says Best Buy's CISO Deb Dixson. By always asking, "Why not?" when approaching a solution, "his questions change people's minds about how to think about IT," says Dixson.

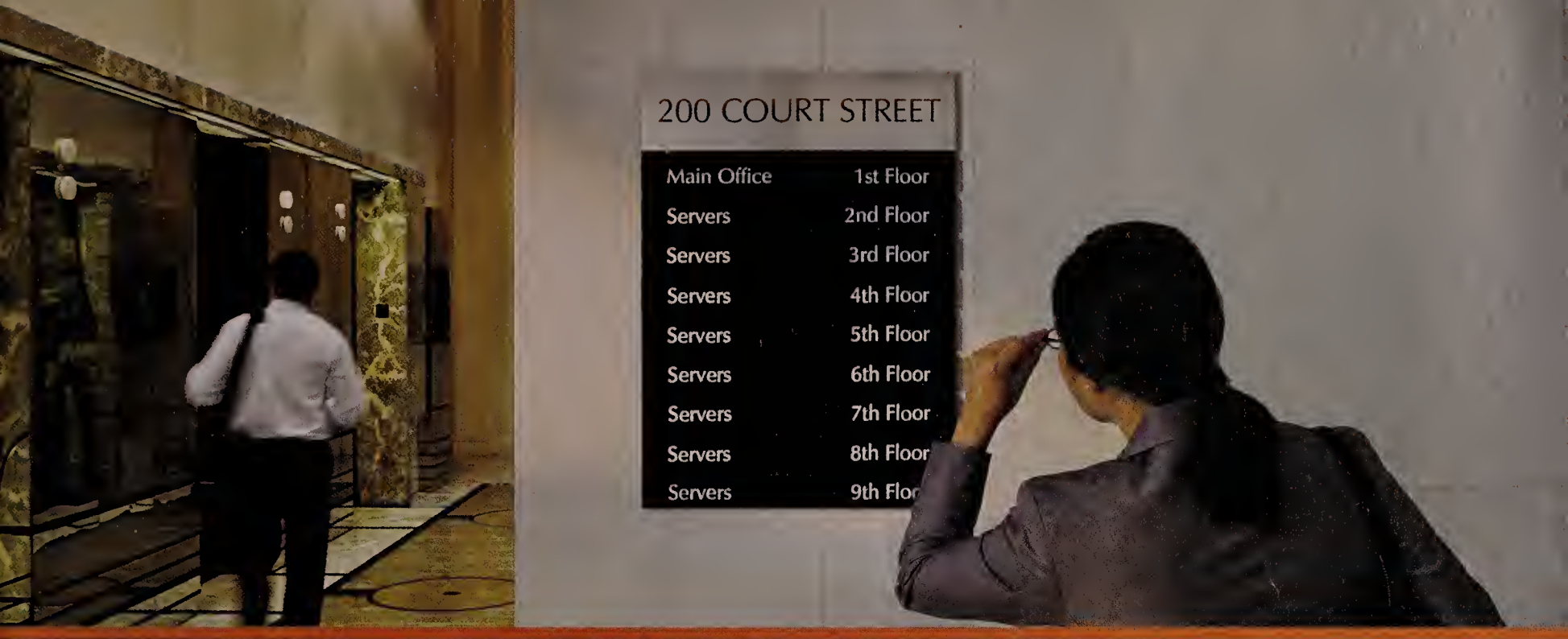
Doreen Wright

Change Leader

SVP and CIO, Campbell Soup (Retired)

Held executive posts at Merrill Lynch and Bankers Trust. Developed multicurrency accounting system at Bankers Trust. • Joined Prudential in 1995 as SVP of operations and systems. Developed award-winning application unifying multiple internal investment product systems through single workstation, enabling customer service capability independent of production and distribution channels. • EVP and CIO of Nabisco. Developed its Web order entry capability, HR portal and launched e-freight service. • Campbell Soup's SVP and Global CIO in 2001. Transformed IT by introducing processes governing portfolio management and investment selection, program management and business change management. Centralized, standardized and outsourced global infrastructure and AMS. Successfully deployed a $140 million SAP implementation across all Campbell North American businesses which was cited as case study by MIT. • Managed extensive organization redesign, new compensation plans, performance management and succession planning processes as interim head of Campbell's HR department in 2002. • Serves on Campbell's Diversity Advisory Board.

Working with Wright, Campbell President and CEO Douglas Conant says he developed "a deeper appreciation for the value of standardized processes across our global enterprise." But, he adds, "what differentiates her from other CIOs is her contributions above and beyond the traditional IT role." When he appointed Wright interim head of HR in 2002, she helped not only with overall management but with a cultural transformation that required Campbell to turn over 300 of its top 350 executives and promote more than 100 from within the company. "She has the ability to balance the drive for results with encouraging individual development," notes Joseph Spagnoletti, SVP and CIO for Campbell and a former direct report.



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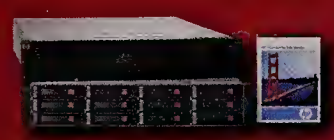

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DuWayne J. Peterson
Ron J. Ponder
Paul A. Strassmann
Patricia M. Wallington

2007

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John Boushy
Robert Carter
Barbra Cooper
Rick Dalzell
John Doucette
Jim Flyzik
Monte Ford
Paul Gaffney
John Glaser
Darwin John
David Kepler
Shaygan Kheradpir
Dawn Lepore
Randy Mott
Michael Prince
Rebecca Rhoads
Ralph Szygenda
Kevin Turner
Carl Wilson

2008

Dave Barnes
June Drewry
Bruce Goodman
Patricia Lawicki
Patricia Morrison
Keith Morrow
John Puckett
Geir Ramleth
Andreas Resch
Peter Walton
Robert Willett
Doreen Wright

Finalists

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Tom Conophy
LaVerne Council
Anna Ewing
Kevin Hart
Kumud Kalia
Frank Modruson
Roger Parks
Wayne Sadin
Tony Scott
Suresh A. Shanmugam
Patricia Skarulis

methodology

We accepted nominations for this year's Hall of Fame during the month of May. We asked each of the nominees to provide us with additional information about their accomplishments as well as names of references familiar with their work. Judging took place in early July, resulting in the selection of 12 new inductees and an additional 13 finalists who we felt were worthy of recognition. Finalists are eligible for future induction. CIO

To find out more about the 2008 Hall of Fame inductees, go to *www.cio.com/cio-awards/cio-hall-of-fame/index*. Learn about the 2007 inductees at *www.cio.com/article/141000* and the 1997 inductees at *www.cio.com/article/104201*.

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The Next Generation

Who will fill your shoes? The CIO of BAE Systems' Customer Solutions group shares his method for encouraging and training potential successors.

BY ROBERT FECTEAU

My staff could look at any single day of my professional life and decide based on this that they would never want to be a CIO. They see me as the person that must answer all the hard questions when systems and processes don't work. They think my job is hard and complex, and that it appears to be nearly impossible to succeed at.

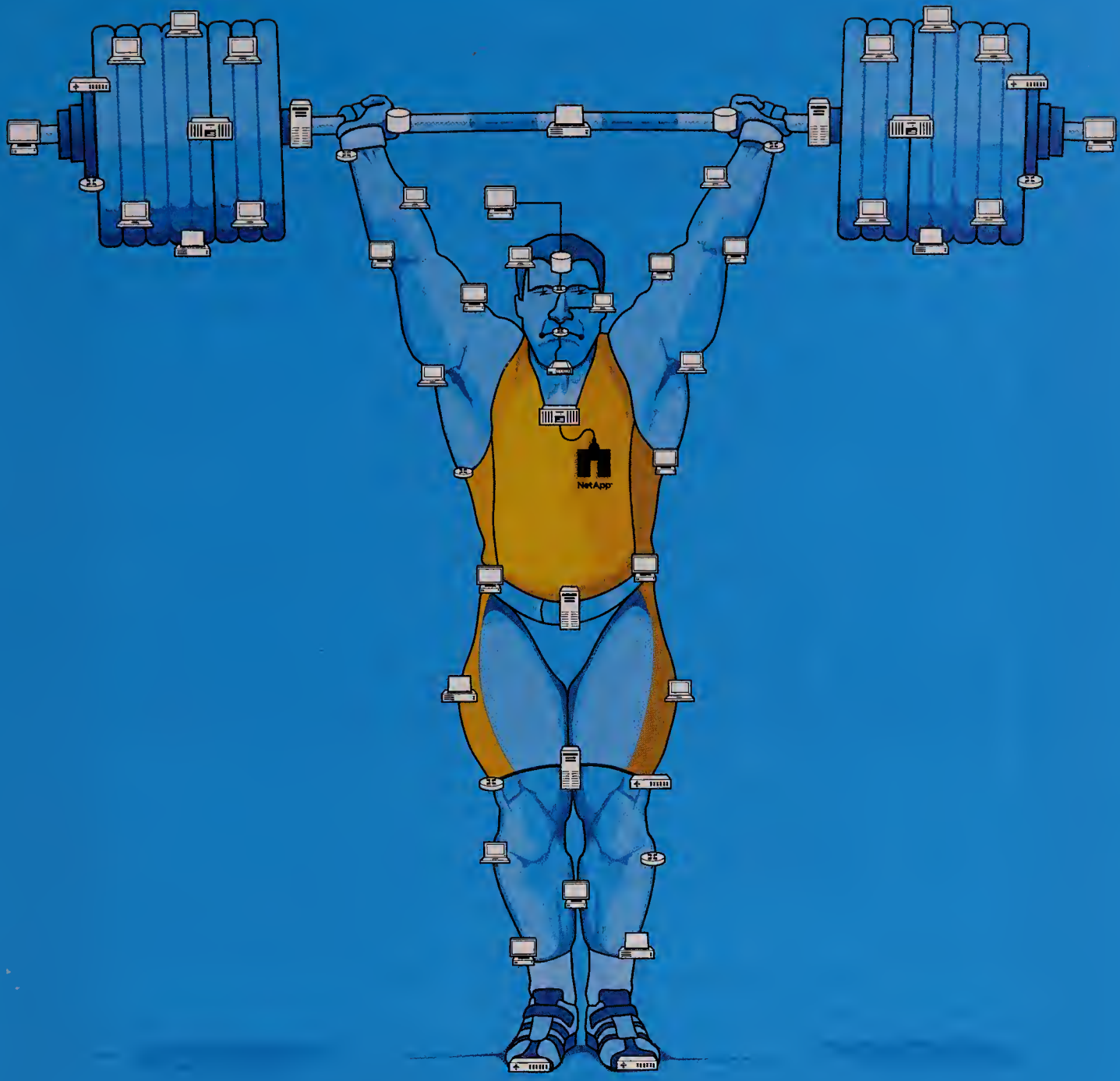
This perception is widespread in the IT industry, which makes it all the more important for the current generation of CIOs to develop and maintain a robust pipeline of future CIO candidates. Being prepared to rapidly replace people in critical leadership positions is also a business imperative. Thus, we need to make the case for the CIO job to the IT and business professionals who we believe can step into our shoes.

I am always looking for IT or business leaders who I think can make the jump to CIO. But it's not enough to identify them; we also have to develop them as leaders. Even when individuals say they want to be a CIO, often they don't really know what the job entails or what it could require of them.

I use my CIO office to provide potential CIOs with a formal development process to support our future IT leadership needs. It includes rotational positions on my team and opportunities to serve in business leadership roles. It is also important to look at external talent. A promotion to CIO should not be a rite of passage or an entitlement. Nevertheless, CIOs are responsible for developing talented people, giving them the right experience and then selecting the very best talent for open positions.

What Future CIOs Must Know

I start by explaining the core responsibilities of my job: I oversee information resource management and operations for the business. While it is helpful to have IT skills that can be applied to solve problems, the primary role of the CIO is to tie corporate strategy to IT investment in order to improve business capabilities and efficiencies.



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I believe that the core abilities people need to become successful CIOs are:

- **Analysis skills.** The CIO career path should include business systems analyst experience. Such jobs prove that a person can use problem-solving skills and analysis techniques to apply technology in the right place at the right time, in support of the business needs. CIOs also need process analysis experience so they can leverage knowledge of current and future IT capabilities that will improve processes.
- **Financial acumen.** Experience managing financial investments is critical. CIOs are responsible for one of the largest investments the business makes, and we must be able to evaluate the effectiveness of these investments against the business cases that established their requirements.
- **Communications expertise.** CIOs must be able to communicate with—and listen to—business leaders, the workforce and the IT industry. This give-and-take is the only way to ensure that the CIO office is making a difference to the company and that systems are working as intended.

With these capabilities as development goals, I use my CIO office as a place to develop up-and-coming leaders.

How to Teach Them

My approach is to teach potential CIOs how the IT department functions within the business as well as provide training in specific business disciplines.

I start by using the CIO office as a development opportunity. Most CIOs would agree that exposure to top-level business decision making is essential for people who are interested in becoming CIOs—they need to understand how IT systems and processes interrelate with other business functions. What better place to provide that exposure than within the office of the CIO? My CIO office consists of dedicated and matrixed personnel, with the positions of business systems analyst and portfolio systems analyst identified for rotational development. For 24 to 36 months, we expose the individuals in these positions to the executive level of the business and hone their skills in IT capital planning, business process analysis, communication of IT value and management of large programs.

What's Your Succession Plan?

Learn **HOW TO DEVELOP THE NEXT GENERATION OF I.T. LEADERS** at **www.cio.com/article/341067.**

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One of their key duties and most important experiences comes in defining the enterprise system plan and architecture. To do this, they interact with senior leadership to collect information about the business strategy and organizational requirements. They use this information to support enterprise architecture development.

Even when individuals say they want to be a CIO, often they don't really know what the job entails or what it could require of them.

People in rotations also study where the business will be in the future, look at the technology infrastructure we have in place today and plan the migration to systems that will represent the future state.

Through such experiences, these individuals gain first-hand exposure to strategy and long-term planning from an IT and business perspective. They learn that the systems that are here today are not necessarily going to be here tomorrow. And they learn how to budget for, plan and execute programs that get us to where the business needs to be.

After the potential CIOs spend two to three years in the CIO office, I work to provide them with experience in managing a part of the business. They may run a P&L center in one of our lines of business. They may work in functional areas such as human resources or finance. Or they may run an internal IT program such as implementation of a major ERP subcomponent. In these roles, they take and apply the knowledge they have acquired in direct support of the business. These assignments can last for two to five years.

The Well-Rounded CIO

Once individuals have sufficient background and work experience—and when they decide that they really want to be a CIO—we provide further development. For example, we might send them to formal training programs that teach the fundamentals of IT capital planning, investment control, portfolio management, IT security or IT leadership—whatever is needed to round out their capabilities and qualify them for a potential CIO role in one of our businesses.

Ultimately, CIOs determined to build the leadership pipeline need to consider why today's IT professionals would care to step into our shoes. The people I see who really want CIO jobs are the people who are focused on making a difference in how IT contributes to the success of the business. They also want a job where they have the freedom to contribute to the business as a whole.

This kind of freedom to make things better across the business spectrum is not only the key attraction to the job, it's our value proposition. We must work harder to get that message across to those we hope will follow in our footsteps. CIO

Robert Fecteau is CIO of BAE Systems' Customer Solutions operating group. To comment, go to *www.cio.com/article/454915*.

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INDEX OF COMPANIES AND ADVERTISERS

Page numbers refer to the first page of the article(s) in which the company has a substantial mention.
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COMPANY INDEX

Aircell LLC 13
Allied Business Intelligence Inc. 13
Amazon.com Inc. 8, 32
American Airlines Inc. 13
Bank of America Corp. 13
Bayer AG 51
Bechtel Corp. 8, 32, 51
Best Buy. 51
Blockbuster Inc. 51
Boston Consulting Group Inc., The . . . 13
CIO Partners 13
CSC Brands LP. 51
Chubb Corp., The 51
Delta Air Lines Inc. 13
DuPont. 51
ExpressHR 23
Forrester Research Inc. 13, 23
Google Inc. 8, 23, 32
Hess Corp. 51
Hudson 13
Humana Inc. 51
IBM Corp. 13
Infor 13
J. Gold Associates LLC 13
JPMorgan Chase & Co. 13
Liquid Machines. 23
Merrill Lynch & Co. Inc. 13
Microsoft Corp. 13
Motorola Inc. 51
Odin Technologies 13
Oracle 13
Pacific Gas and Electric Co. 51
RSR Research LLC 13
Secerno 23
United Parcel Service of America Inc. . 51
Wachovia Corp. 13
Washington Mutual Inc. 13
Wells Fargo. 13
YouTube LLC 8, 32

ADVERTISER INDEX

3PAR 4
Accenture C2
Advanced Micro Devices Inc. 37
American Power Conversion 46
CA Inc. 41
CDW Corp. 63
Cognizant Technology Solutions . . . 24a
CommVault 2
Compucom Systems Inc. 29, 48a
CXO Media Inc. 25, 49, 69, 71
Digital Realty Trust C4
Fiberlink Communications 39
Fujitsu 43
Hewlett-Packard Co. . . . 9, 21, 34, 50, 59
Interactive Intelligence Inc. 12
InterSystems Corp. 31
McAfee Inc. 55
Microsoft and Novell 27
Microsoft Corp. 11
NEC Corp. 15
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Palm Inc. 17
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Primavera Systems Inc. 61
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SunGard Availability Services 65
Tata Consultancy Services 53
Verizon Wireless C3
VMware Inc. 19

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Shavlik Technologies

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IT managers who secure their virtual systems

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69%

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35%

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